



# Operation Manual

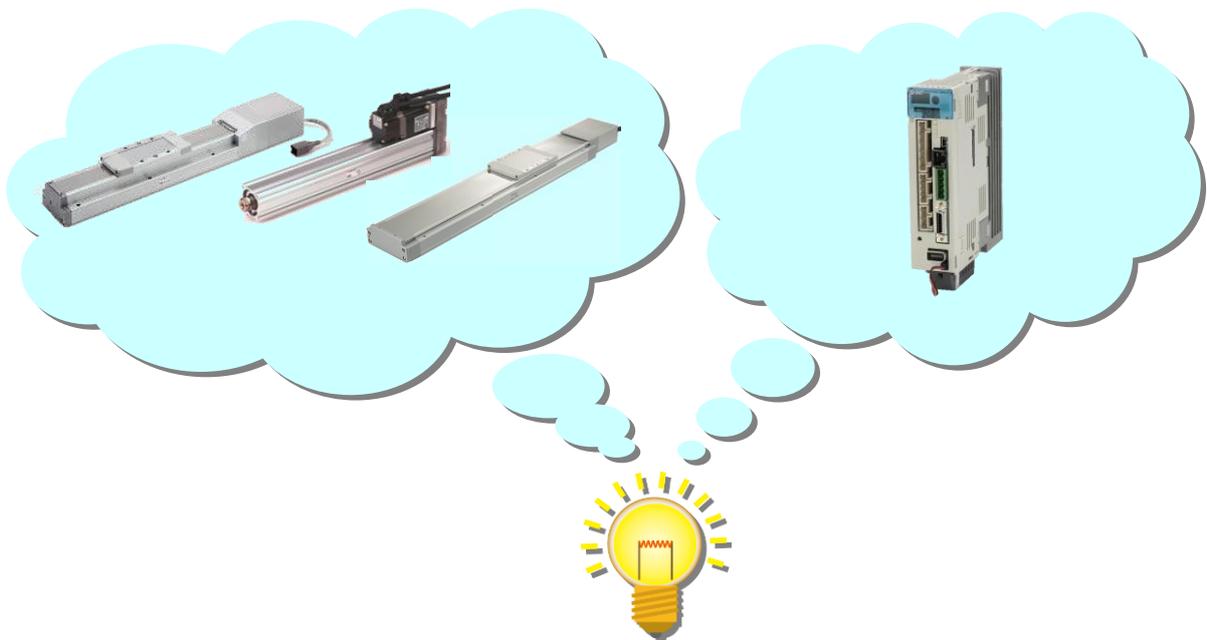
(Simplified edition)

PRODUCT NAME

## *AC Servo Motor Driver (CC-Link Type)*

MODEL / Series / Product Number

### **LECSC Series**



# SMC Corporation



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# LECSC Series / Driver Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC), Japan Industrial Standards (JIS)\*1) and other safety regulations\*2).

- \*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems  
ISO 4413: Hydraulic fluid power -- General rules relating to systems  
IEC 60204-1: Safety of machinery -- Electrical equipment of machines (Part 1: General requirements)  
ISO 10218-1992: Manipulating industrial robots -- Safety  
JIS B 8370: General rules for pneumatic equipment.  
JIS B 8361: General rules for hydraulic equipment.  
JIS B 9960-1: Safety of machinery -- Electrical equipment for machines. (Part 1: General requirements)  
JIS B 8433-1993: Manipulating industrial robots - Safety.etc.

\*2) Labor Safety and Sanitation Law, etc.



## Caution

**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



## Warning

**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



## Danger

**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

## Warning

### 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### 2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1) Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2) Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and lock circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3) An application which could have negative effects on people, property, or animals requiring special

safety analysis.

4) Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Note that the  CAUTION level may lead to a serious consequence according to conditions. Please follow the instructions of both levels because they are important to personnel safety.



# LECSC Series / Driver Safety Instructions

## Caution

**The product is provided for use in manufacturing industries.**

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

## Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

### Limited warranty and Disclaimer

**The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*3)**

**Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.**

**For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.**

**This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.**

**Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.**

**\*3) Vacuum pads are excluded from this 1 year warranty.**

**A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.**

**Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.**

### Compliance Requirements

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

## Introduction

It is recommended that the operator read the operation manual for LECSC prior to use.  
For the handling and details of other equipment, please refer to the operation manual for used equipment.

Check that the main circuit power supply (AC100V/AC200V) and controller circuit power supply (AC100V/AC200V) are wired correctly.

When using the emergency stop SW etc. provided by customer, wire it to the EMG (Forced stop) of the input/output signal(CN6-1).

When wiring, I/O connector(LE-CSNA) or I/O cable(LEC-CSNA-1) is required.  
(EMG (Forced stop) cannot be controlled with CC-Link.)

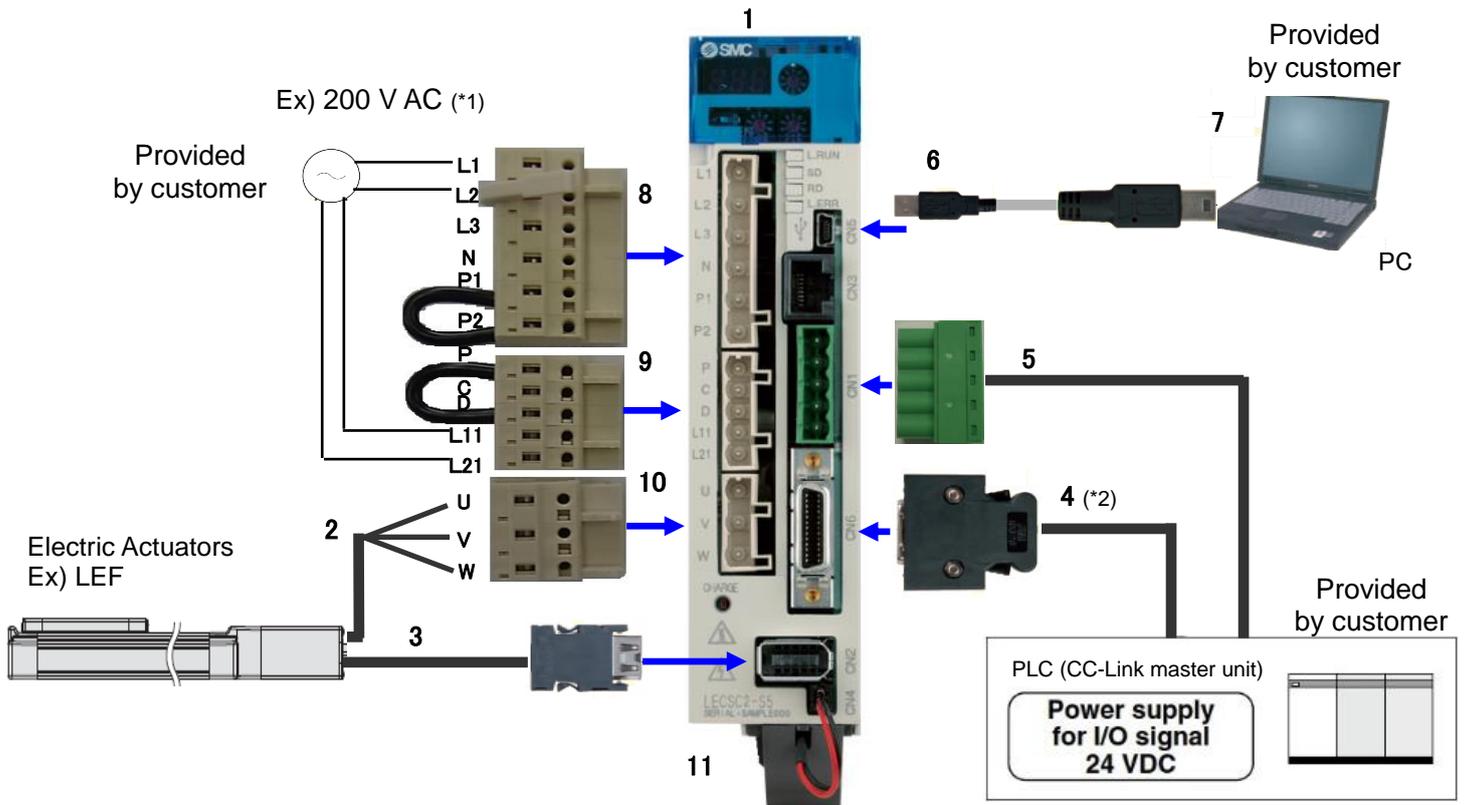
Please put the wiring for EMG (Forced stop) into the state of EMG release (operational).  
(EMG (Forced stop) can be compulsorily set to automatic ON by the parameter.)

Please refer to chapter 4 of the "LECSC Operation Manual" and chapter 3 of the "LECSC Operation Manual (Simplified Edition)" for details.

When setup software (MR Configurator2™) is used, the LECSC□-□ model selection is required.  
Select 'MR-J3-T' through "Model" - "New" and "Project".

# 1. Configuration

Minimum equipment and wiring requirements to get started



(\*1) Refer to “LECSC Operation Manual”, Chapter 4 for further details if the power supply voltage is 100VAC.

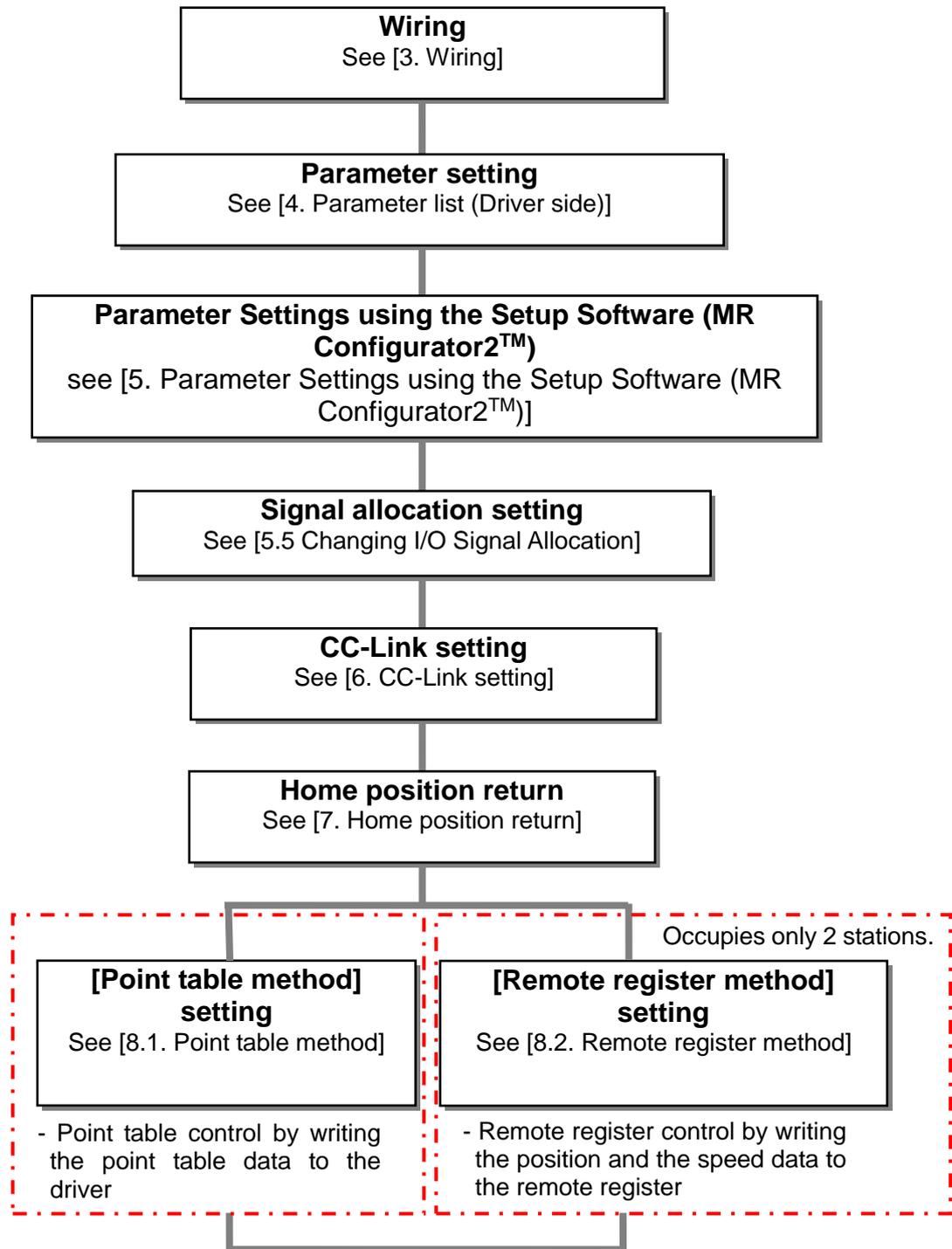
(\*2) When wiring to EMG (Forced stop) of input/output signal(CN6-1), I/O connector(LE-CSNA) or I/O cable(LEC-CSNA-1) is required.  
(EMG (Forced stop) cannot be controlled with CC-Link.)

1	Driver	LECSC*-S*
2	Motor cable	LE-CSM-***
3	Encoder cable	LE-CSE-***
4	I/O connector	LE-CSNA
	I/O cable	LEC-CSNA-1
5	CC-Link connector	CN1 (Accessory) of Mitsubishi Electric System & Service Co., Ltd. Product number : K05A 502 306 00
6	USB cable	LEC-MR-J3USB
7	Setup software (MR Configurator2™)	LEC-MRC2E
8	Main circuit power supply connector	CNP1 (Accessory)
9	Control circuit power supply connector	CNP2 (Accessory)
10	Motor connector	CNP3 (Accessory)
11	Battery	LEC-MR-J3BAT (a bundled item) It is unnecessary when using it with the incremental system.

Note) The lock cable option is not shown on this drawing. Refer to the “LECSC Operation Manual” for details.

## 2. Pre-Operation Procedure

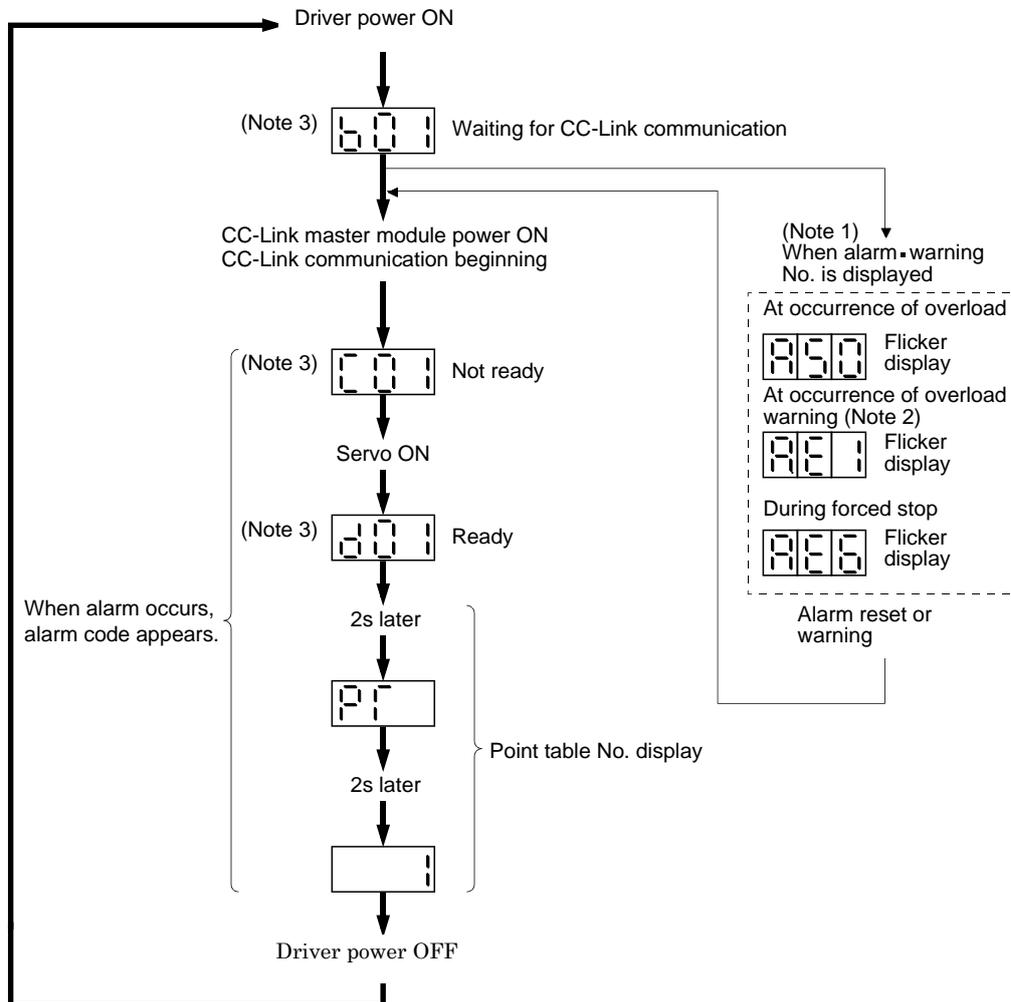
### 2.1 Flow chart



## 2.2 Driver display

On the driver display (three-digit, seven-segment display), check the status of communication with the CC-Link driver at power-on, check the station number, and diagnose a fault at occurrence of an alarm.

### (1) Display sequence



Note 1. Only alarm and warning No. are displayed, but no station No. is displayed.

Note 2. If warning other than AE6 occurs during the servo on, flickering the second place of decimal point indicates that it is during the servo on.

Note 3. The right-hand segments of b01, c02 and d16 indicate the axis number.  
(Below example indicates Station No.1)

b01	c02	...	d64
Station No.1	Station No.2		Station No.64

## (2) Indication list

Indication	Status	Description
b##	Waiting for CC-Link communication	<ul style="list-style-type: none"> <li>Power of the CC-Link master module was switched on at the condition that the power of CC-Link master module is OFF.</li> <li>The CC-Link master module is faulty.</li> </ul>
(Note 1) d##	Ready	The servo was switched on after completion of initialization and the driver is ready to operate. (This is indicated for 2 seconds.)
(Note 1) C##	Not ready	The driver is being initialized or an alarm has occurred.
(Note 2) \$\$\$	Ready for operation	Two seconds have passed after the driver is ready to operate by turning ON the servo-on (RYn1).
(Note 3) A**	Alarm · Warning	The alarm No./warning No. that occurred is displayed. (Refer to section 10.4.)
888	CPU error	CPU watchdog error has occurred.
(Note 4) b00	(Note 4) Test operation mode	JOG operation · positioning operation · programmed operation · DO forced output · single-step feed
(Note 1) d## C##		Motor-less operation

Note 1. ## denotes any of numerals 00 to 16 and what it means is listed below.

##	Description
00	Set to the test operation mode.
01	Station number 1
02	Station number 2
03	Station number 3
:	:
:	:
62	Station number 62
63	Station number 63
64	Station number 64

Note 2. \$\$\$ indicates numbers from 0 to 255, and the number indicates the executing point table number.

3. \*\* indicates the warning/alarm No.

4. Requires set up software(MR Configurator2™) .

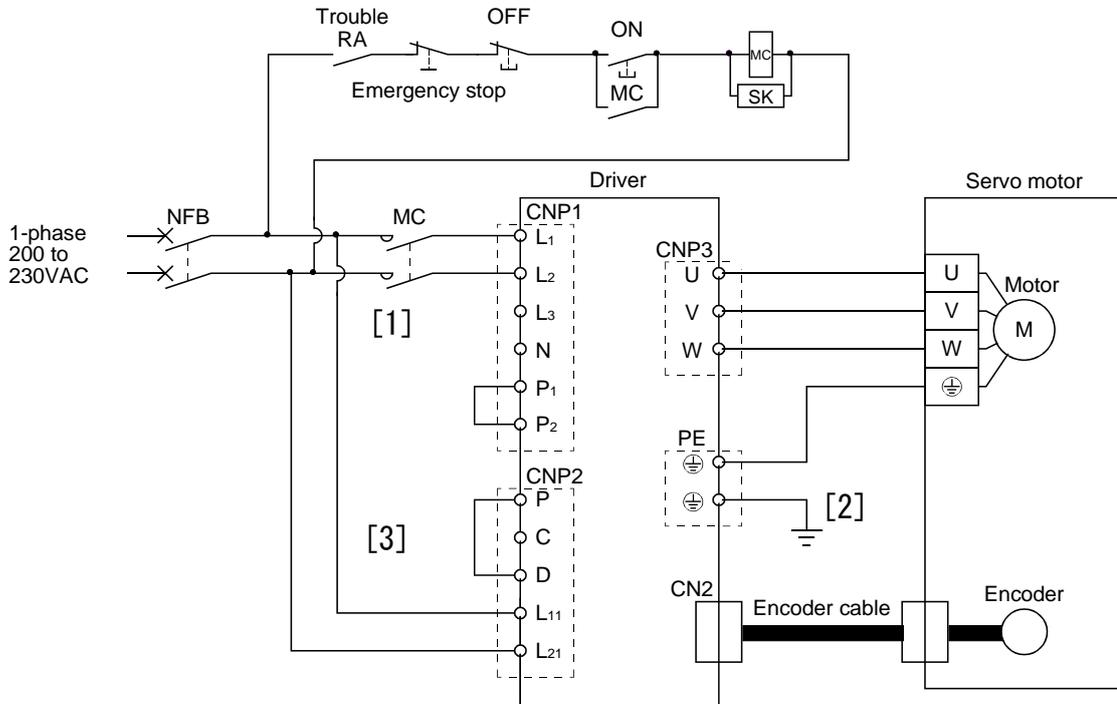
## 3. Wiring

### 3.1 Power Supply Wiring

Connect the actuator and driver power supply.

(1) LECSC (Absolute encoder)

EX.) Power supply is AC200V single phase



[1] Power supply input terminal: Supply specified power supply.

[2] - Connect the motor power supply input terminal (U, V, W) to the driver power terminal (U, V, W)

- Connect the motor ground terminal to the driver ground terminal.

- Connect the cable for detector.

[3] Supply specified power to the control circuit power supply.

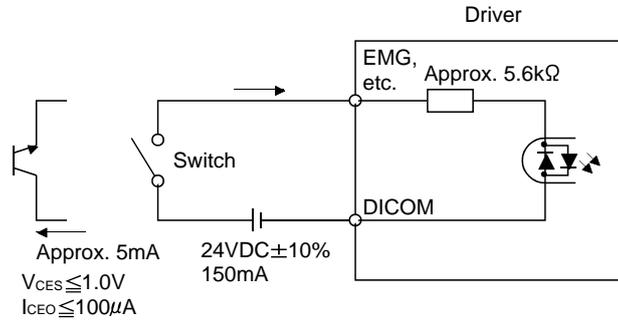
Refer to "LECSC Operation Manual", Chapter 4 for further details if the power supply voltage is 100VAC.



### 3.2.2 Source I/O interfaces

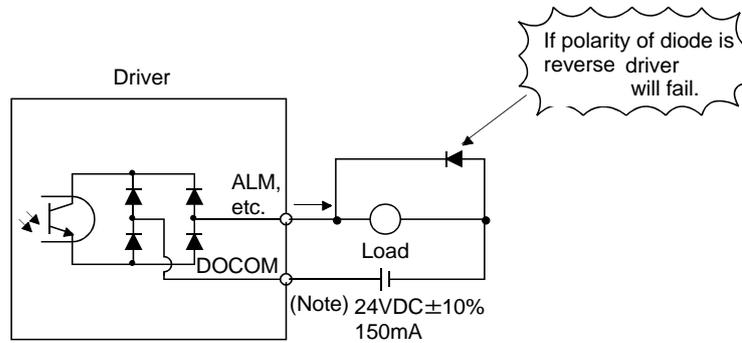
It is possible to configure the I/O interface for, source type I/O interface. In this case, all (DI-1) input signals and (DO-1) output signals are of source type. wire according to the following interfaces.

#### (1) Digital input interface DI-1



#### (2) Digital output interface DO-1

A maximum of 2.6V voltage drop occurs in the driver.



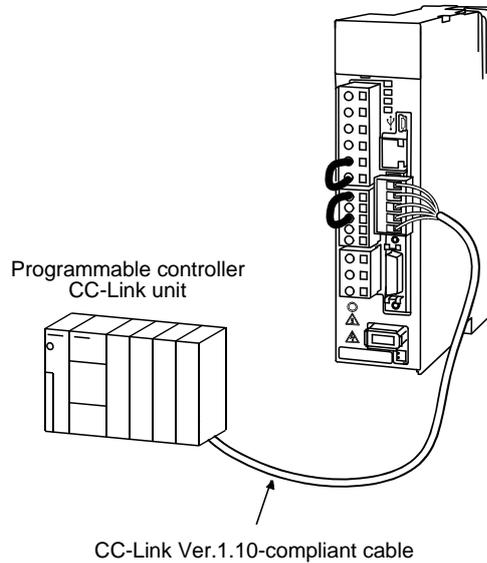
Note. If the voltage drop (maximum of 2.6V) interferes with the relay operation, apply higher voltage (up to 26.4V) from an external source.

### 3.3 Wiring of PLC and driver

Connect the PLC and the driver.

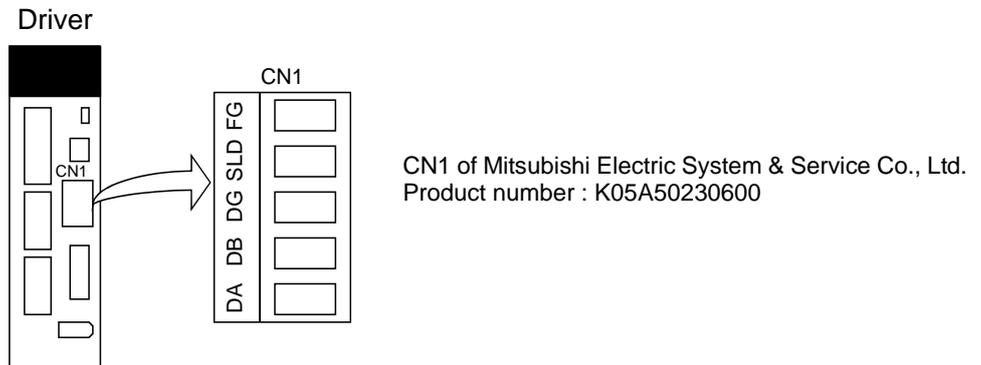
#### (1) Wiring of PLC and driver

Connect the programmable driver CC-Link master unit station and the driver by a twisted cable (3-wire type).

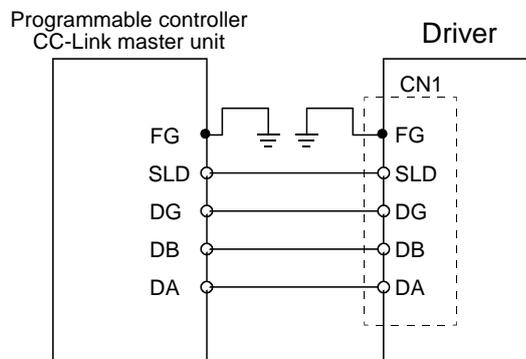


#### (2) Wiring of connector

The pin layout of the communication connector CN1 on the driver unit is shown below.



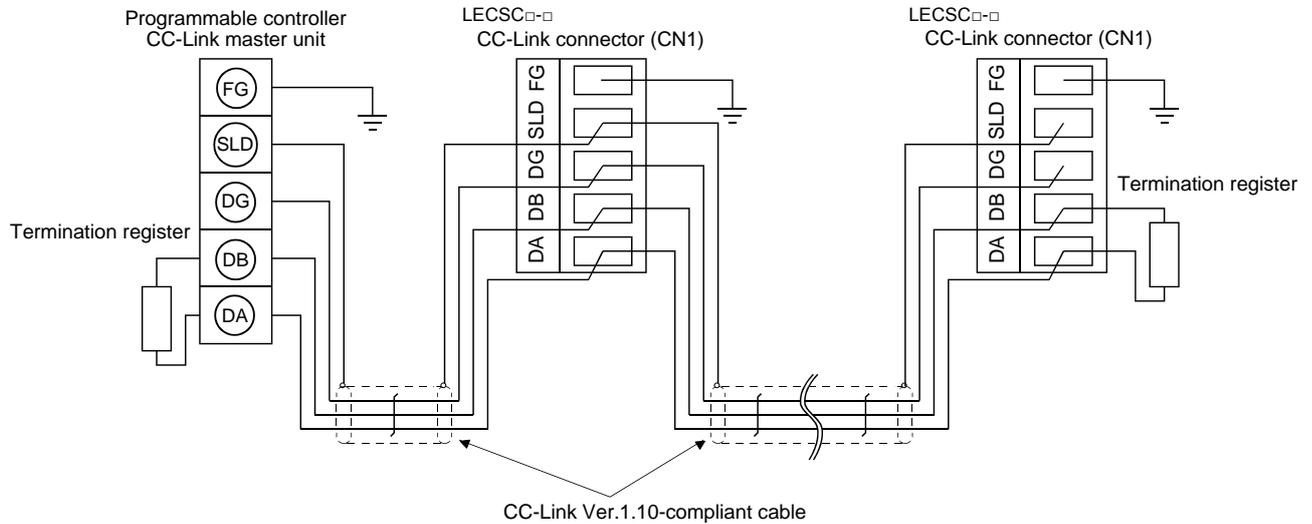
The driver and programmable driver CC-Link master unit are wired as shown below. Refer to “LESC Operation Manual”, section 13.4 (3) for the CC-Link Ver.1.10-compliant cable used for connection.



### (3) Connecting multiple units

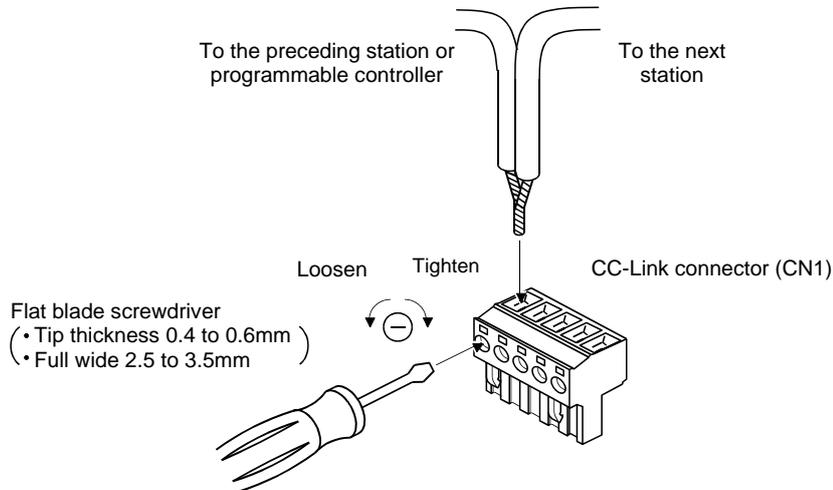
#### Example for connecting multiple servo units

As the remote I/O stations of CC-Link, drivers share the link system and can be controlled/monitored using programmable driver user programs.



### (4) Insert the power line

Insert the core of the cable into the opening and tighten it with a flat-blade screwdriver so that it will not come loose. (Tightening torque: 0.5 to 0.6N · m) When inserting the wire into the opening, make sure that the terminal screw is fully loose.



## 4. Parameter list (Driver side)

Parameters require setting. If necessary, please set the parameters.

Refer to "LECSC Operation Manual", chapter 6 and "LECSC Operation Manual (Simplified Edition)", section 5.3 for details.

Refer to "LECSC Operation Manual", chapter 6 for parameters which are not mentioned.

Setup software (MR Configurator2™ :LEC-MRC2E) is necessary for the setting of parameter.

\*1 Setup software version 1.52E or above is required.

\*2 The setup software (MR Configurator2™ : LEC-MRC2E) must be purchased as an additional item.

\*3 The USB cable (LEC-MR-J3USB) must be purchased as an additional item.

### (1) [Basic setting parameters (No. PA□□)]

No.	Symbol	Name	Initial value	Unit
PA01	*STY	Control mode	0000h	
PA03	*ABS	Absolute position detection system	0000h	
PA05	*FTY	Feeding function selection	0000h	
PA06	*CMX	Electronic gear numerator	1	
PA07	*CDV	Electronic gear denominator	1	
PA08	ATU	Auto tuning mode	0001h	
PA09	RSP	Auto tuning response	12	
PA10	INP	In-position range	100	μm
PA14	*POL	Rotation direction selection	0	

### (2) [Extension setting parameters (No. PC□□)]

No.	Symbol	Name	Initial value	Unit
PC02	*ZTY	Home position return type	0000h	
PC03	*ZDIR	Home position return direction	0001h	
PC04	ZRF	Home position return speed	500	r/min
PC05	CRF	Creep speed	10	r/min
PC06	ZST	Home position shift distance	0	μm
PC07	*ZPS	Home position return position data	0	× 10 <sup>STM</sup> μm
PC12	JOJ	Jog speed	100	r/min
PC24	*COP3	Function selection C-3	0000h	
PC30	*DSS	Remote register-based position/speed specifying system selection	0000h	
PC31	LMPL	Software limit +	0	× 10 <sup>STM</sup> μm
PC32	LMPH			
PC33	LMNL	Software limit -	0	× 10 <sup>STM</sup> μm
PC34	LMNH			

### (3) [I/O setting parameters (No. PD□□)]

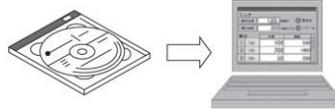
Change the allocation of the input/output signal and select the input signal automatic ON.

Refer to "LECSC Operation Manual", section 6.4 and "LECSC Operation Manual (Simplified Edition)", section 5.5 for details.

## 5. Parameter Configuration using Setup software (MR Configurator2™)

This section describes the configuration procedure for main parameters using the setup software (MR Configurator2™: LEC-MRC2E). See chapter 6 of the "LECS Operation Manual" for parameter details.

### 5.1 Setup software (MR Configurator2™)



\*1 Setup software version 1.52E or above is required.

\*2 The setup software (MR Configurator2™:LEC-MRC2E) must be purchased as an additional item.

\*3 The USB cable (LEC-MR-J3USB) must be purchased as an additional item.

#### 5.1.1 Installation Method

Perform installation according to the "MR Configurator2™ instruction manual" (Manual/ib0300160\*.pdf) contained on the setup software (MR Configurator2™) CD-ROM. The "MR Configurator2™" software will be added to the PC.

#### 5.2 Basic driver set-up for Initial Test Drive

Switch on the main circuit power supply (AC100V/AC200V) and controller circuit power supply (AC100V/AC200V) to the LECS driver.

When the driver display flashes as shown below, it wires for EMG and ON (state of EMG release (operational)).

When wiring, I/O connector(LE-CSNA) or I/O cable(LEC-CSNA-1) is required.  
(EMG (Forced stop) cannot be controlled with CC-Link.)

AL. E6

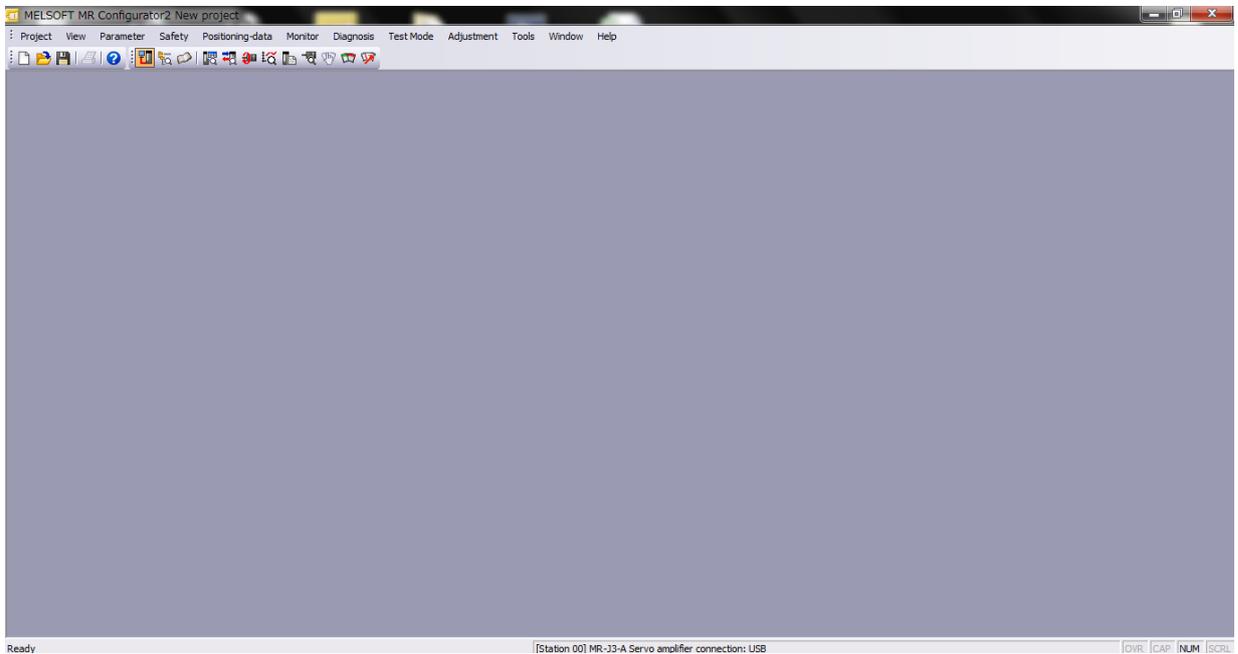
If the power supply is turned on for the first time, refer to "LECS Operation Manual", chapter 5.

## 5.2.1 Start up the Setup software (MR Configurator2™)

- ① Connect the PC and LECSC using the USB cable.
- ② Turn on the power of the LECSC.
- ③ Start application “MR Configurator2”.

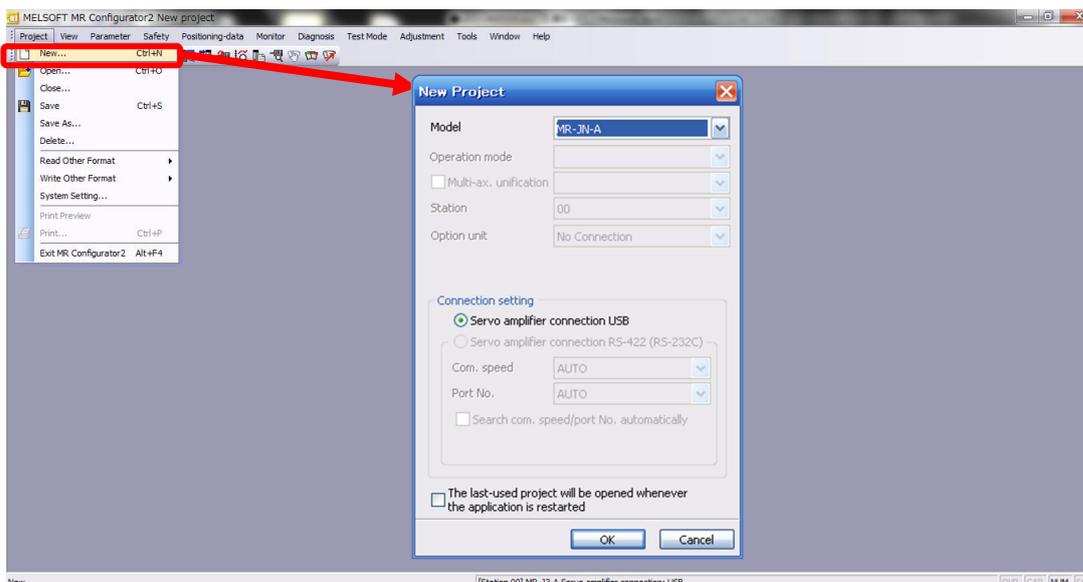


Once the application starts, the screen below will be displayed.



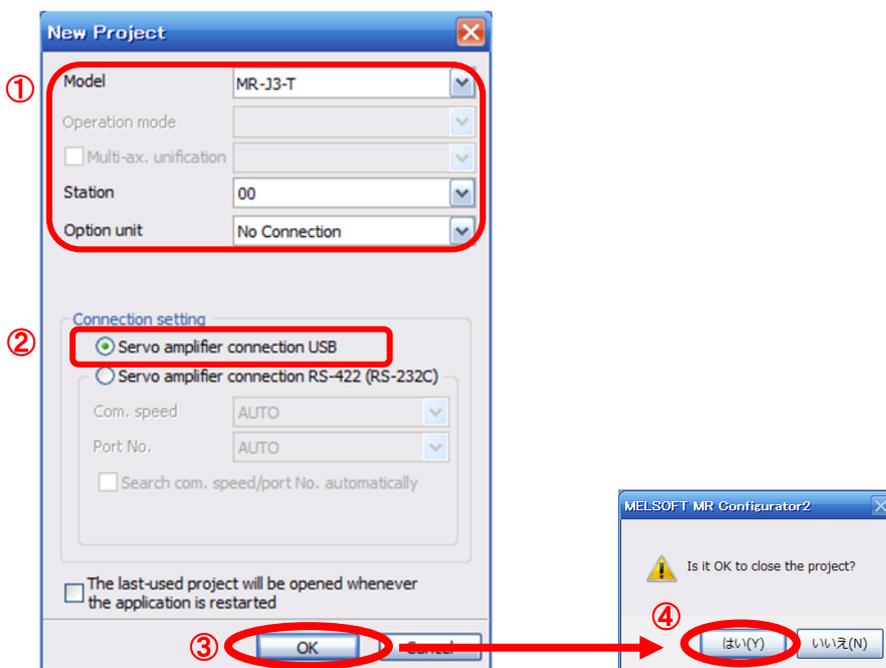
## 5.2.2 “System Settings”

- ① From “Project” menu select “New”, the “New project” window will be displayed.



## 5.2.3 Model Selection

- ① The Mitsubishi Electric Corporation series will be displayed in the model selection list. Please select the model “MR-J3-T”, if using the LECSC. Please select the station for the USB connection. Please to match the value of parameter [PC20] and the station. Please select the station “00”, if you want to use for the first time. Please select the option unit “No Connection”.
- ② Please select “servo amplifier connection USB” as the communication device.
- ③ Click OK.
- ④ Click OK.



## 5.2.4 Driver ON LINE Check

Check that the driver is enabled (ONLINE).



Check that the “ONLINE/OFFLINE” icon is displayed “  ”.

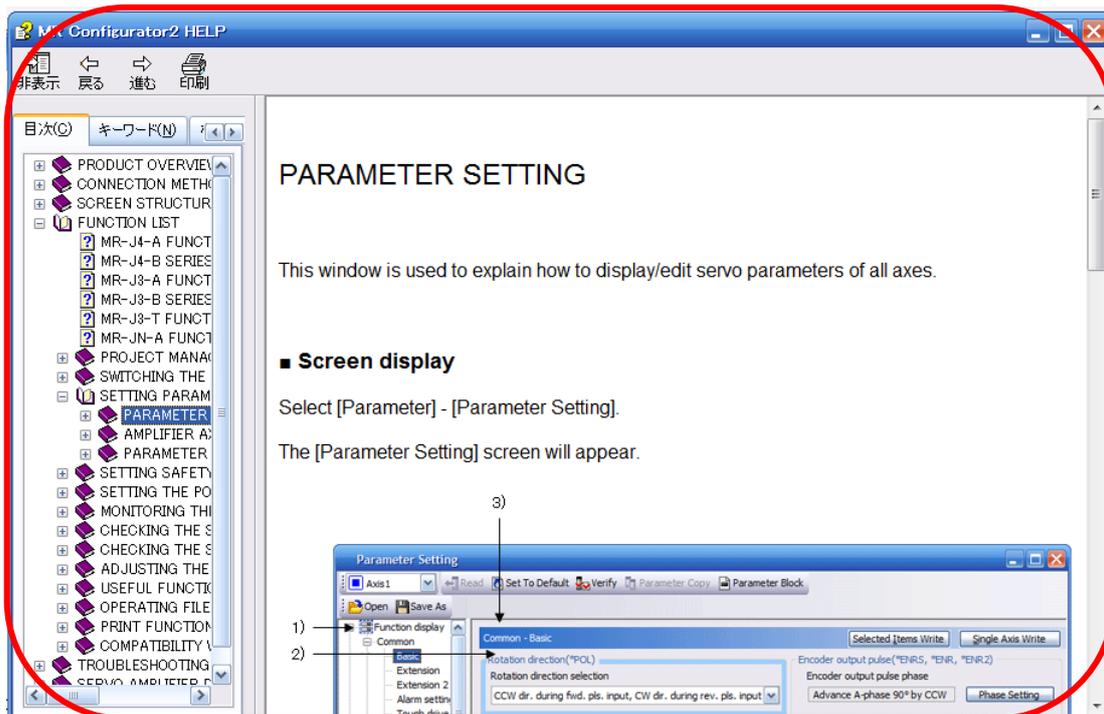
It is OFFLINE when displayed as “  ”.

\* For OFFLine, PC and amplifier aren't communicating. Confirm the following points.

- Is amplifier's power supply turning on?
- Are PC and amplifier connected with the USB cable?
- Is the USB driver installed?
- Is the USB driver which is compliant to Windows version installed?
- Is the setting of “Port” for USB connection corresponding?  
Please to match the value of parameter [PC20] and the station.  
Please select the station “00”, if you want to use for the first time.  
Please select the option unit “No Connection”.

## 5.2.5 Help Function

By selecting “MR Configurator2 Help” in “Help” from any window of the setup software, a “HELP” screen will be shown.

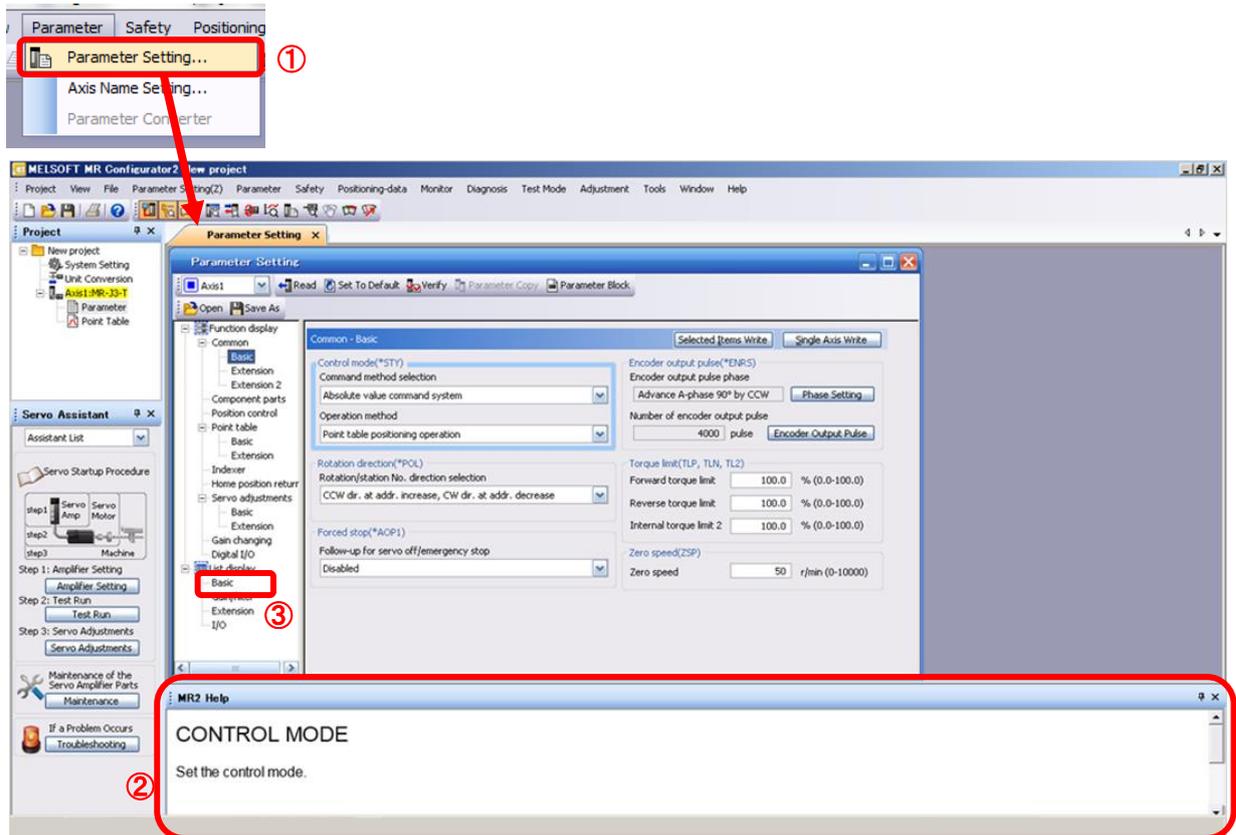


### 5.3 Parameter Settings (Driver side)

The setup software (MR Configurator2™:LEC-MRC2E) is necessary for setting the parameter.

- \*1 Setup software version 1.52E or above is required.
- \*2 The setup software (MR Configurator2™:LEC-MRC2E) must be purchased as an additional item.
- \*3 The USB cable (LEC-MR-J3USB) must be purchased as an additional item.

- ① From the “Parameter” menu select “Parameter Setting”, the “parameter setting” window will open.
- ② The explanation of the parameter item is displayed in “MR2 Help”.  
(When it is not displayed, from the “View” menu select “Docking window” – “Docking Help”.)



- ③ When each item of “List display” is clicked, “Parameter list” screen along each item is displayed. When “Basic” is selected, it is displayed as follows.

Basic		Selected Items Write		Single Axis Write	
No.	Abbr.	Name	Units	Setting range	Axis1
PA01	*STY	Control mode		0000-0F55	0000
PA02	*REG	Regenerative option		0000-71FF	0000
PA03	*ABS	Absolute position detection system		0000-0004	0000
PA04	*AOP1	Function selection A-1		0000-F031	0000
PA05	*FBP	Number of command input pulses per revolution		0-0 / 1000-50000	0
PA06	CMX	Elec. gear numerator (Cmd. pls. mult. factor num.)		1-1048576	1
PA07	CDV	Elec. gear denominator (Cmd. pls. mult. factor den.)		1-1048576	1
PA08	ATU	Auto tuning mode		0000-0003	0001
PA09	RSP	Auto tuning response		1-32	12
PA10	INP	In-position range	pulse	0-65535	100
PA11	TLP	Forward rotation torque limit	%	0.0-100.0	100.0
PA12	TLN	Reverse rotation torque limit	%	0.0-100.0	100.0
PA13	*PLSS	Command pulse input status		0000-0812	0000
PA14	*POL	Rotation direction selection		0-1	0
PA15	*ENR	Encoder output pulse	pulse/rev	1-1048576	4000
PA16	*ENR2	For manufacturer setting		0000-FFFF	0000
PA17	*MSR	For manufacturer setting		0000-FFFF	0000
PA18	*MTY	For manufacturer setting		0000-FFFF	0000
PA19	*BLK	Parameter block		0000-FFFF	000C

Refer to "LECS Operation Manual", chapter 6 for details of each parameter.

### 5.3.1 Change of parameter block

To enable settings for all parameters.

- ① Select "Basic settings (list)" tab and change "PA19" value to "000C".
- ② Click the "PA19" row then click "Selected Items Write".
- ③ **Cycle the power off, then on for parameters for this driver to be enabled.**

Basic					
No.	Abbr.	Name	Units	Setting range	Axis1
PA01	*STY	Control mode		0000-0F55	0000
PA02	*REG	Regenerative option		0000-71FF	0000
PA03	*ABS	Absolute position detection system		0000-0004	0000
PA04	*AOP1	Function selection A-1		0000-F031	0000
PA05	*FBP	Number of command input pulses per revolution		0-0 / 1000-50000	0
PA06	CMX	Elec. gear numerator (Cmd. pls. mult. factor num.)		1-1048576	1
PA07	CDV	Elec. gear denominator (Cmd. pls. mult. factor den.)		1-1048576	1
PA08	ATU	Auto tuning mode		0000-0003	0001
PA09	RSP	Auto tuning response		1-32	12
PA10	INP	In-position range	pulse	0-65535	100
PA11	TLP	Forward rotation torque limit	%	0.0-100.0	100.0
PA12	TLN	Reverse rotation torque limit	%	0.0-100.0	100.0
PA13	*PLSS	Command pulse input status		0000-0812	0000
PA14	*POL	Rotation direction selection		0-1	0
PA15	*ENR	Encoder output pulse	pulse/rev	1-1048576	4000
PA16	*ENR2	For manufacturer setting		0000-FFFF	0000
PA17	*MSR	For manufacturer setting		0000-FFFF	0000
PA18	*MTY	For manufacturer setting		0000-FFFF	0000
PA19	*BLK	Parameter block		0000-FFFF	000C

- ④ Please click "Read".



When changing of each parameter, note the following points.

Note1) Some of the various parameters, there is "**Enable once on again turning the power OFF after setting**". (If you do not the power to OFF, it does not reflect the data in the driver.)

Note2) "Selected Items Write": It writes the parameter values of the corresponding frame to the driver.

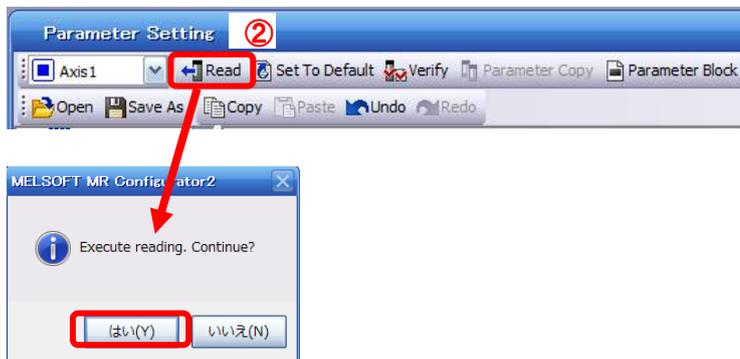
"Single Axis Write": It writes all of the parameters to the driver.

Note3) Do not change "For manufacturer setting" parameters. If you change by these by mistake, it may cause the amplifier to not work properly.

### 5.3.2 Change of parameter block

If you read the parameters of the driver to the software, please do the "read" operation.

- ① From the View menu bar "parameter (A)" - please click on the "parameter setting (P)". "Parameter Settings" screen will display.
- ② Please click on the "Read".



### 5.3.3 Parameter Configuration Method (Ex. "Control mode" Selection)

Please set the parameters for each actuator.

Please change the parameter values according to usage.

Refer to "LECSC Operation Manual", chapter 6 for details of each parameter.

Refer to "LECSC Operation Manual (Simplified Edition)", section 5.4.3 for recommended parameter values for SMC supplied actuators.

• Setting example of the Control mode (PA01) (in the case of setting to "**Absolute value command system**").

① Set the parameters of the PA01 to "0000" in the "Basic" tab.

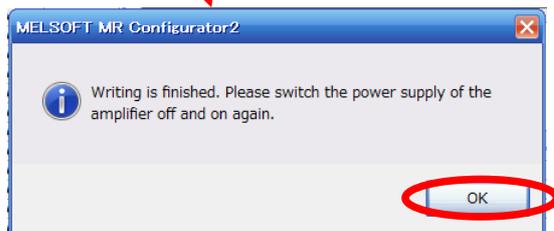
• Setting example of the Control mode (PA01) (in the case of setting to "**Incremental value command system**").

① Set the parameters of the PA01 to "0001" in the "Basic" tab.

② Click on the "Single Axis Write" button.

③ **Turn the power OFF and ON again. The Parameter is then enabled.**

No.	Abbr.	Name	Units	Setting range	Axis1
PA01	*STY	Control mode		0000-2F01	0000
PA02	*REG	Regenerative option		0000-71FF	0000
PA03	*ABS	Absolute position detection system		0000-0001	0000



When changing of each parameter, note the following points.

Note1) Some of the various parameters, there is "**Enable once on again turning the power OFF after setting**".  
(If you do not the power to OFF, it does not reflect the data in the driver.)

Note2) "Selected Items Write": It writes the parameter values of the corresponding frame to the driver.

"Single Axis Write": It writes all of the parameters to the driver.

Note3) Do not change "For manufacturer setting" parameters. If you change by these by mistake, it may cause the amplifier to not work properly.

### 5.3.4 Recommended Parameter Values by Actuator Model

Please change the parameter values according to the customer application. Refer to "LECS Operation Manual", chapter 6 for details.

#### Recommended Parameter Values [LEF]

Series			LEFS25			LEFS32			LEFS40		
	Lead symbol		H	A	B	H	A	B	H	A	B
	Lead		20	12	6	24	16	8	30	20	10
Parameter *1,*2	Para. No.	Initial value	Recommended value								
Electronic gear numerator *3	PA06	1	<b>32768</b>								
Electronic gear denominator *3	PA07	1	<b>2500</b>	<b>1500</b>	<b>750</b>	<b>3000</b>	<b>2000</b>	<b>1000</b>	<b>3750</b>	<b>2500</b>	<b>1250</b>
Feel length multiplication (STM) (Multiplier)	PA05	0000	<b>0000(Less than stroke 1000)/ 0001(Stroke 1000 or more)</b>								
Home position return type	PC02	0000	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 3(Stopper type)								
Home position return direction	PC03	0001	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1 (Motor side)								
Home position return Speed (rpm)	PC04	500	<b>90</b>	<b>150</b>	<b>300</b>	<b>75</b>	<b>113</b>	<b>225</b>	<b>60</b>	<b>90</b>	<b>180</b>
Home position return position data (μm)	PC07	0	<b>-2000(Less than stroke 1000) / -200(Stroke 1000 or more)</b>								
Stopper type home position return stopper time (msec)	PC09	100	<b>200</b>								
Stopper type home position return torque limit value (%)	PC10	15	<b>30</b>								
Regenerative option	PA02	0000	<b>0000(Non) / 0002(LEC-MR-RB-032)</b>								
Rotation direction selection *4	PA14	0	<b>1(+: Counter motors side)</b>								
Adaptive tuning mode	PB01	0000	0000								
Load to motor inertia moment ratio	PB06	7	7								
Machine resonance suppression filter 1	PB13	4500	4500								
Notch shape selection 1	PB14	0000	0000								

 Different from the initial value.

- \*1 Parameter is the recommended value. Please change the parameter to the appropriate value for the operating method.
- \*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.
- \*3 The minimum unit of the travel distance of the actuator should be 1 [μm].
- \*4. When the motor mounting position is right side parallel (LEFS\*R) or left side parallel (LEFS\*L), the rotation direction PA14 selection is 0(+: Counter motors side).

Series			LEFB25	LEFB25U	LEFB32	LEFB32U	LEFB40	LEFB40U
	Lead symbol		S					
	Lead		54					
Parameter *1,*2	Para. No.	Initial value	Recommended value					
Electronic gear numerator *3	PA06	1	<b>32768</b>					
Electronic gear denominator *3	PA07	1	<b>6750</b>					
Feel length multiplication (STM) (Multiplier)	PA05	0000	<b>0000(Less than stroke 1000)/ 0001(Stroke 1000 or more)</b>					
Home position return type	PC02	0000	□□□3(Stopper type)					
Home position return direction	PC03	0001	□□□1 (Motor side)					
Home position return Speed (rpm)	PC04	500	<b>33</b>					
Home position return position data (μm)	PC07	0	<b>-3000(Less than stroke 1000) / -300(Stroke 1000 or more)</b>					
Stopper type home position return stopper time (msec)	PC09	100	<b>200</b>					
Stopper type home position return torque limit value (%)	PC10	15	<b>30</b>					
Regenerative option	PA02	0000	<b>0000(Non) / 0002(LEC-MR-RB-032)</b>					
Rotation direction selection	PA14	0	<b>1(+: Counter motors side)</b>	0(+: Counter motors side)	<b>1(+: Counter motors side)</b>	0(+: Counter motors side)	<b>1(+: Counter motors side)</b>	0(+: Counter motors side)
★ Adaptive tuning mode	PB01	0000	<b>0002</b>		0000			
★ Load to motor inertia moment ratio	PB06	7	<b>50</b>					
★ Machine resonance suppression filter 1	PB13	4500	<b>400</b>		4500			
★ Notch shape selection 1	PB14	0000	<b>0030</b>		0000			

★ Parameter should be changed.

Different from the initial value.

- \*1 Parameter is the recommended value. Please change the parameter to the appropriate value for the operating method.
- \*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.
- \*3 The minimum unit of the travel distance of the actuator should be 1 [μm].

## Recommended Parameter Values [LEJ]

Series			LEJS40			LEJS63			LEJB40	LEJB63	
	Lead symbol		H	A	B	H	A	B	T		
	Lead		24	16	8	30	20	10	27	42	
Parameter *1,*2	Para. No.	Initial value	Recommended value								
Electronic gear numerator *3	PA06	1	<b>32768</b>								
Electronic gear denominator *3	PA07	1	<b>3000</b>	<b>2000</b>	<b>1000</b>	<b>3750</b>	<b>2500</b>	<b>1250</b>	<b>3375</b>	<b>5250</b>	
Feel length multiplication (STM) (Multiplier)	PA05	0000	<b>0000(Less than stroke 1000) / 0001(Stroke 1000 or more)</b>								
Home position return type	PC02	0000	<b>□□□3(Stopper type)</b>								
Home position return direction	PC03	0001	<b>□□□1 (Motor side)</b>								
Home position return Speed (rpm)	PC04	500	<b>75</b>	<b>113</b>	<b>225</b>	<b>60</b>	<b>90</b>	<b>180</b>	<b>133</b>	<b>86</b>	
Home position return position data (μm)	PC07	0	<b>-2000(Less than stroke 1000) / -200(Stroke 1000 or more)</b>								
Stopper type home position return stopper time (msec)	PC09	100	<b>200</b>								
Stopper type home position return torque limit value (%)	PC10	15	<b>30</b>								
Regenerative option	PA02	0000	<b>0000(Non) / 0002(LEC-MR-RB-032) / 0003(LEC-MR-RB-12)</b>								
Rotation direction selection	PA14	0	<b>1 (+ : Counter motors side)</b>						<b>0 (+ : Counter motors side)</b>		
★ Adaptive tuning mode	PB01	0000	0000						<b>0002</b>	0000	
★ Load to motor inertia moment ratio	PB06	7	7						<b>50</b>		
★ Machine resonance suppression filter 1	PB13	4500	4500						<b>400</b>	4500	
★ Notch shape selection 1	PB14	0000	0000						<b>0030</b>	0000	

★ Parameter should be changed.  
 Different from the initial value.

- \*1 Parameter is the recommended value. Please change the parameter to the appropriate value for the operating method.
- \*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.
- \*3 The minimum unit of the travel distance of the actuator should be 1 [μm].

## Recommended Parameter Values [LEY]

Series	LEY25/LEYG25			LEY25D/LEYG25D			LEY32/LEYG32			LEY32D/LEYG32D				
	Lead symbol			A	B	C	A	B	C	A	B	C		
	Lead			12	6	3	12	6	3	20	10	5	16	8
Parameter *1,*2	Para. No	Initial value	Recommended value											
Electronic gear numerator *3	PA06	1	<b>32768</b>											
Electronic gear denominator *3	PA07	1	1500	750	375	1500	750	375	2500	1250	625	2000	1000	500
Feel length multiplication (STM) (Multiplier)	PA05	0000	<b>0000 (Less than stroke 1000) / 0001 (Stroke 1000 or more)</b>											
Home position return type	PC02	0000	<b>□□□3 (Stopper type)</b>											
Home position return direction	PC03	0001	<b>□□□1 (Motor side)</b>											
Home position return Speed (rpm)	PC04	500	150	300	600	150	300	600	90	180	360	112	225	450
Home position return position data (μm)	PC07	0	<b>-2000(Less than stroke 1000) / -200(Stroke 1000 or more)</b>											
Stopper type home position return stopper time (msec)	PC09	100	<b>200</b>											
Stopper type home position return torque limit value (%)	PC10	15	<b>30</b>											
Regenerative option	PA02	0000	<b>0000 (Non)/ 0002 (LEC-MR-RB-032)</b>											
Rotation direction selection *4	PA14	0	0 (+: Counter motors side)			1 (+: Counter motors side)			0 (+: Counter motors side)			1 (+: Counter motors side)		
Adaptive tuning mode	PB01	0000	0000											
Load to motor inertia moment ratio	PB06	7	7											
Machine resonance suppression filter 1	PB13	4500	4500											
Notch shape selection 1	PB14	0000	0000											

  Different from the initial value.

- \*1 Parameter is the recommended value. Please change the parameter to the appropriate value for the operating method.
- \*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.
- \*3 The minimum unit of the travel distance of the actuator should be 1 [μm].
- \*4 When the motor mounting position is right side parallel (LEY\*R / LEYG\*R) or left side parallel (LEY\*L / LEYG\*L), the rotation direction selection is 0(+: Counter motors side).

Series			LEY63				LEY63D		
	Lead symbol		A	B	C	L	A	B	C
	Lead (Including pulley ratio)		20	10	5	5(2.86) (Pulley ratio 4/7)	20	10	5
Parameter *1,*2	Para. No	Initial value	Recommended value						
Electronic gear numerator *3	PA06	1	32768			57344	32768		
Electronic gear denominator *3	PA07	1	2500	1250	625	625	2500	1250	625
Feel length multiplication (STM) (Multiplier)	PA05	0000	0000 (Less than stroke 1000) / 0001 (Stroke 1000 or more)						
Home position return type	PC02	0000	□□□3 (Stopper type)						
Home position return direction	PC03	0001	□□□1 (Motor side)						
Home position return speed (rpm)	PC04	500	90	180	360	629	90	180	360
Home position return position data (μm)	PC07	0	-4000 (Less than stroke 1000) / -400(Stroke 1000 or more)						
Stopper type home position return stopper time (msec)	PC09	100	200						
Stopper type home position return torque limit value (%)	PC10	15	30						
Regenerative option	PA02	0000	0000 (Non)/ 0002 (LEC-MR-RB-032)/ 0003 (LEC-MR-RB-12)						
Rotation direction selection *4	PA14	0	0 (+: Counter motors side)				1 (+: Counter motors side)		
Adaptive tuning mode	PB01	0000	0000						
Load to motor inertia moment ratio	PB06	7	7						
Machine resonance suppression filter 1	PB13	4500	4500						
Notch shape selection 1	PB14	0000	0000						

 Different from the initial value.

- \*1 Parameter is the recommended value. Please change the parameter to the appropriate value for the operating method.
- \*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.
- \*3 The minimum unit of the travel distance of the actuator should be 1 [μm].
- \*4 When the motor mounting position is right side parallel (LEY\*R / LEYG\*R) or left side parallel (LEY\*L / LEYG\*L), the rotation direction selection is 0(+: Counter motors side).

### 5.3.5 Absolute position detection system

Select absolute position detection system

Set parameter: [PA03]

Parameter			Initial value	Unit	Setting range
No.	Symbol	Name			
PA03	ABS	Absolute position detection system	0000h		Refer to the text.

POINT
▪ This parameter is made valid when power is cycled on after setting.

Set this parameter when using the absolute position detection system.

Parameter No. PA03

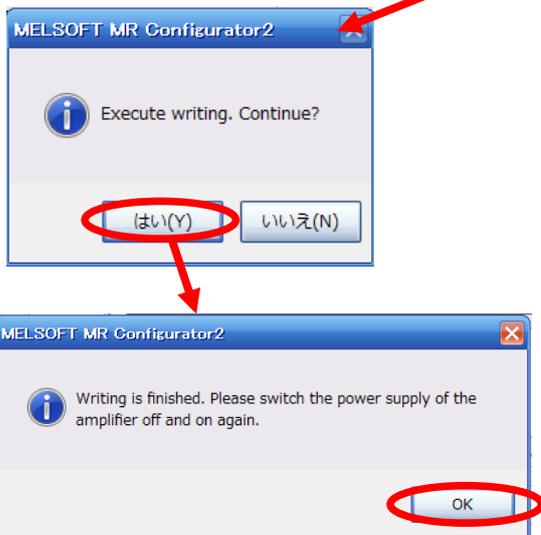
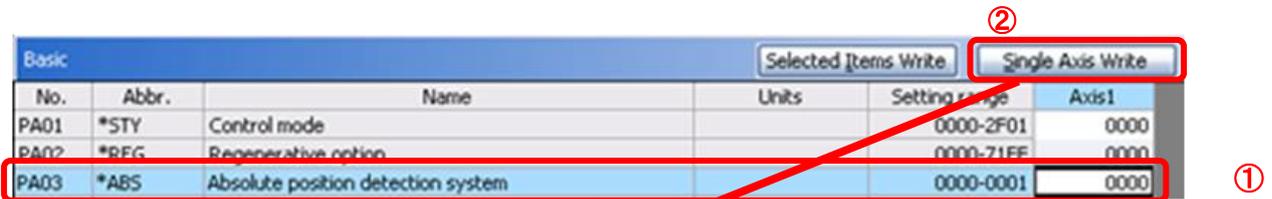
0	0	0	
---	---	---	--

Selection of absolute position detection system  
 0: Used in incremental system  
 1: Used in absolute position detection system

EX.) Use absolute position detection system

[PA03] = 0001

- ① Set the parameters of the PA03 to "0001" in the "Basic" tab.
- ② Click on the "Single Axis Write" button.
- ③ **Turn the power OFF and ON again. The Parameter is then enabled.**



### 5.3.6 Remote register-based position/speed specifying system selection

When controlling the actuator in the remote register system, you must choose a method for controlling the position command data and speed command data.

Select the remote register-based position / speed specifying system.  
Set parameter: [PC30]

No.	Symbol	Name and function	Initial value	Unit	Setting range															
PC30	DSS	Remote register-based position/speed specifying system selection This parameter is made valid when Position/speed specification selection (RY(n+2)A) is turned ON with 2 stations occupied. Select how to receive the position command and speed command. When 1 station is occupied, selection of "0001" or "0002" will result in a parameter error. <div style="border: 1px solid black; padding: 5px; margin: 10px 0;"> <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 30px; text-align: center;">0</td> <td style="width: 30px; text-align: center;">0</td> <td style="width: 30px; text-align: center;">0</td> <td style="width: 30px; text-align: center;"> </td> </tr> </table> </div> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="width: 50px;">Set value</th> <th style="width: 200px;">Position command</th> <th style="width: 200px;">Speed command</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0</td> <td>Specify the point table No.</td> <td></td> </tr> <tr> <td style="text-align: center;">1</td> <td rowspan="2">Set the position data.</td> <td>Specify the point table No.</td> </tr> <tr> <td style="text-align: center;">2</td> <td>Set the servomotor speed. (Note)</td> </tr> </tbody> </table> <p>Note. In this case, always set an acceleration/deceleration time constant in the point table No.1.</p>	0	0	0		Set value	Position command	Speed command	0	Specify the point table No.		1	Set the position data.	Specify the point table No.	2	Set the servomotor speed. (Note)	0000h		Refer to name and function column.
0	0	0																		
Set value	Position command	Speed command																		
0	Specify the point table No.																			
1	Set the position data.	Specify the point table No.																		
2		Set the servomotor speed. (Note)																		

• In the case of using to **point table method**

- ① Set the parameters of the PC30 to "0000" in the "Extension" tab.

• In the case of using to **remote register method**

• In the case of position command setting to **position data** and Speed command setting to **point table No.**

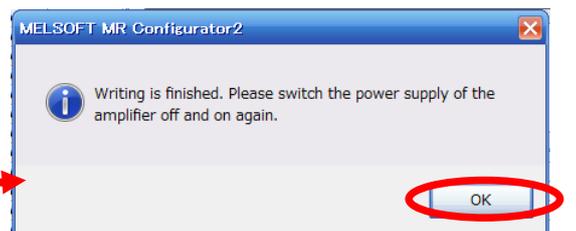
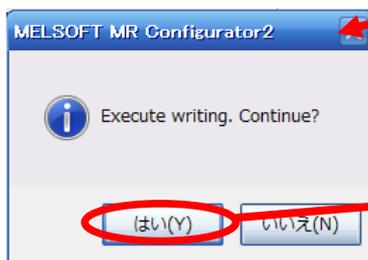
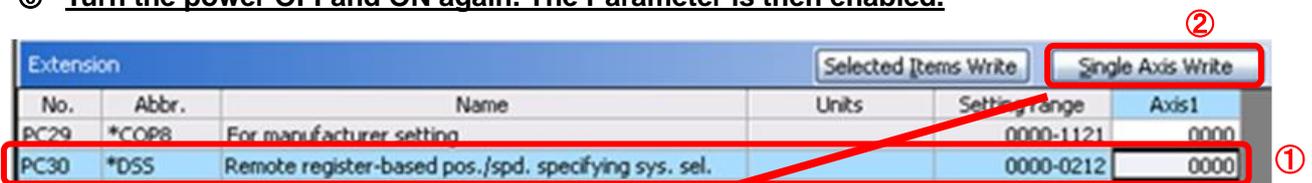
- ① Set the parameters of the PC30 to "0001" in the "Extension" tab.

• In the case of position command setting to **position data** and Speed command setting to **motor speed (rpm)**.

- ① Set the parameters of the PC30 to "0002" in the "Extension" tab.

- ② Click on the "Single Axis Write" button.

- ③ **Turn the power OFF and ON again. The Parameter is then enabled.**



### 5.3.7 Electronic Gears

It is necessary to adjust the electric gear to convert from the command movement value sent from CC-Link master unit to the travel distance (smallest unit is 1[μm] (0.001[mm]) of electrical actuator.

See “LECSC Operation Manual (Simplified Edition)”, section 5.3.4 for the recommended values for electronic gears for each actuator model.

Please configure the electronic gear values according to the customer application.

(1) LECSC Parameter Configuration:[PA06], [PA07]

Parameter			Initial value	Unit	Setting range
No.	Symbol	Name			
PA06	CMX	Electronic gear numerator	1		0 to 65535
PA07	CDV	Electronic gear denominator	1		1 to 65535

Set the values as follows.

<ul style="list-style-type: none"> <li>· <math display="block">\frac{[PA06]}{[PA07]} = \frac{M \times \frac{1}{1000}}{\text{Actuator lead (L) [mm]} \times n1/n2}</math></li> <li>· <math display="block">M : [\text{Servo motor resolution} : 262144(\text{Pulse/rev})]</math></li> <li>· <math display="block">n1/n2 : \text{Pulley ratio} *1</math></li> </ul>
---

EX.) Actuator lead (L = 6mm)  
Pulley ratio (n1/n2 = 1/1)

$$\frac{[PA06]}{[PA07]} = \frac{262144 \times \frac{1}{1000}}{6 \times 1/1}$$

$$\frac{[PA06]}{[PA07]} = \frac{262144}{6 \times 1000}$$

$$\frac{[PA06]}{[PA07]} = \frac{262144}{6000}$$

$$\frac{[PA06]}{[PA07]} = \frac{32768}{750}$$

$$[PA06] = 32768$$

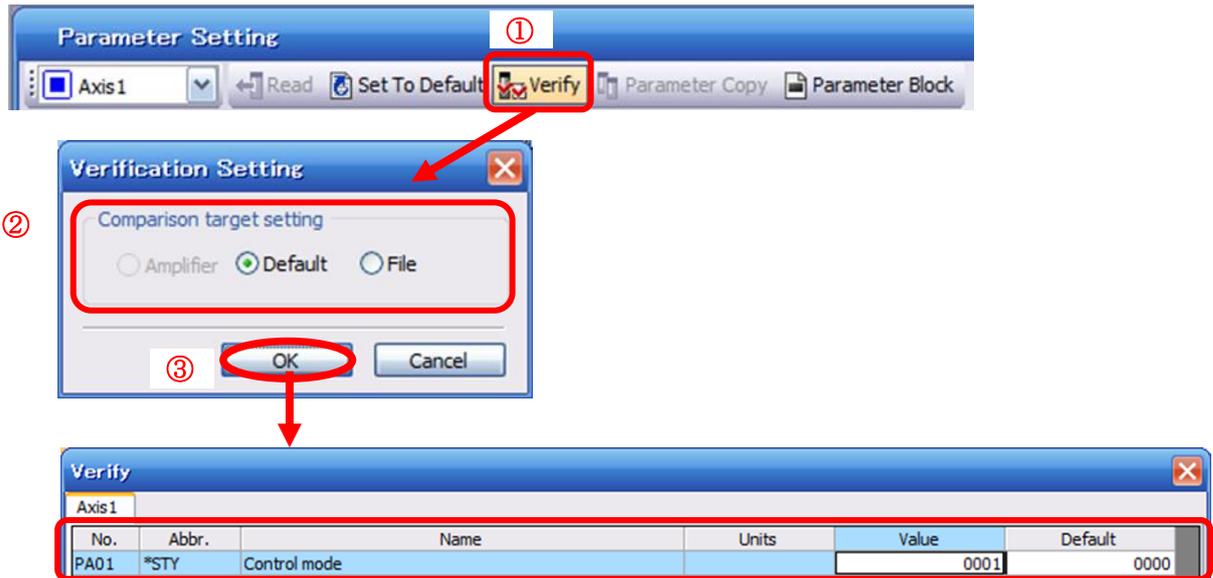
$$[PA07] = 750$$

\*1 For pulley ratio, refer to Lead of “LECSC Operation Manual (Simplified Edition)”, section 5.3.4.  
The actuator not described for pulley ratio is calculated by “1/1”.

### 5.3.8 Verify of parameters

If you want to compare the "parameter" set in the setup software with the " Parameters set in the driver" / "Initial value parameter" / "Saved parameter", perform " Verify ".

- ① Click the "Verify" button on the [Parameter Setting] window. "Verification Setting" screen will display.
- ② Please select the comparison target.  
Amplifier : Compare with the parameters set in the driver.  
Default : Compare with the initial value of the parameter.  
File : Compare with saved parameters.
- ③ Please click "OK" button. The verified result is displayed.



### 5.3.9 Parameter initialization

If you want to initialize parameters in the driver, please perform "Set to Default".

When you initialize the parameters, parameters can not be undone.

Please be sure to save the parameters in use.

(Refer to "LESCS Operation Manual (Simplified Edition)", section 5.8.1 for the parameter storage method.)

- ① Click the "Set To Default" button on the [Parameter Setting] window.
- ② Please click "Yes" button. "Parameter Block" screen will display.  
Set the default using an editable parameter as the browsable range of the selected parameter block.
- ③ Select the parameter block you want to initialize.
- ④ Please click "OK" button.  
Set the default using an editable parameter as the browsable range of the selected parameter block.
- ⑤ Click on the "Single Axis Write" button.
- ⑥ **Turn the power OFF and ON again. Parameter is enabled.**

The screenshots illustrate the following steps:

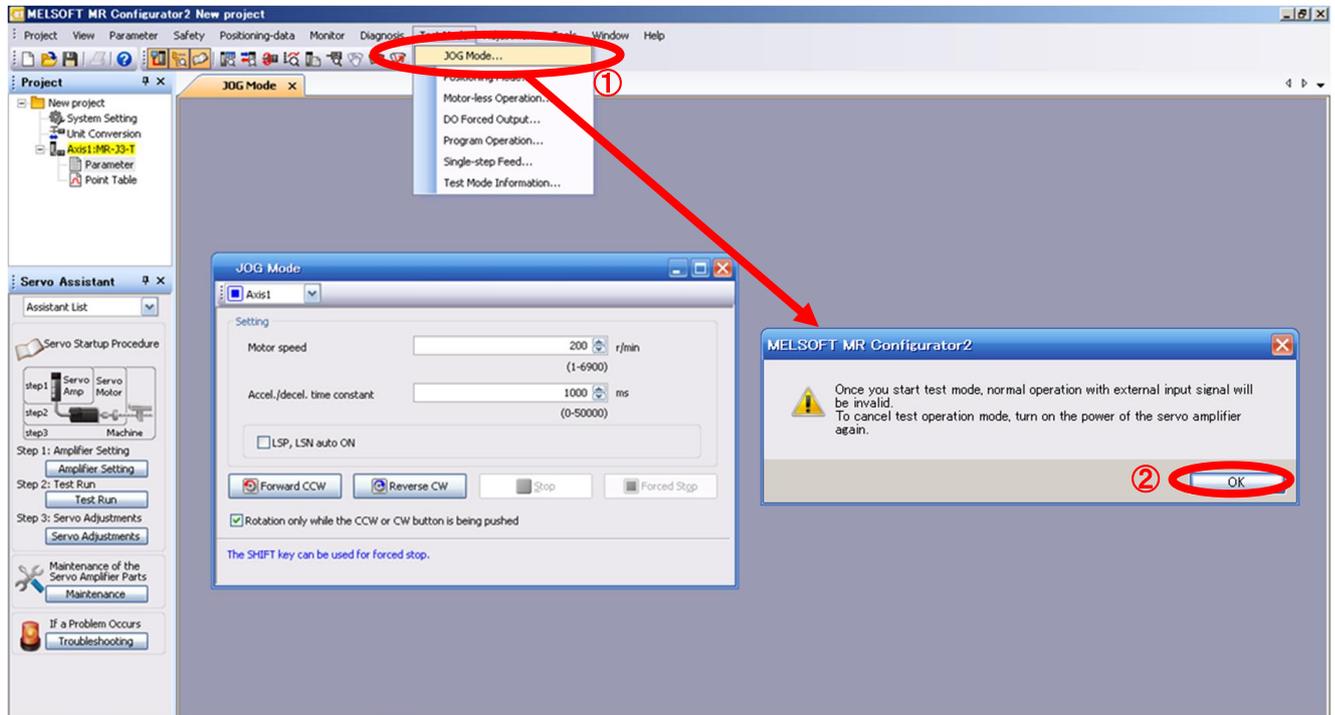
- ① In the "Parameter Setting" window, the "Set To Default" button is highlighted with a red circle and the number 1.
- ② A dialog box "Setting to default. Continue?" appears with a warning icon. The "はい(Y)" button is highlighted with a red circle and the number 2.
- ③ The "Parameter Block" dialog box is shown. The "\*BLK" column in the table is highlighted with a red circle and the number 3.
- ④ In the "Parameter Block" dialog box, the "OK" button is highlighted with a red circle and the number 4.
- ⑤ In the parameter table below, the "Single Axis Write" button is highlighted with a red circle and the number 5.

Basic		Selected Items Write		Single Axis Write	
No.	Abbr.	Name	Units	Setting range	Initial value
PA01	*STY	Control mode		0000-2F01	0000
PA02	*REG	Regenerative option		0000-71FF	0000
PA03	*ABS	Absolute position detection system		0000-0001	0000

## 5.4 JOG Mode in the Setup Software

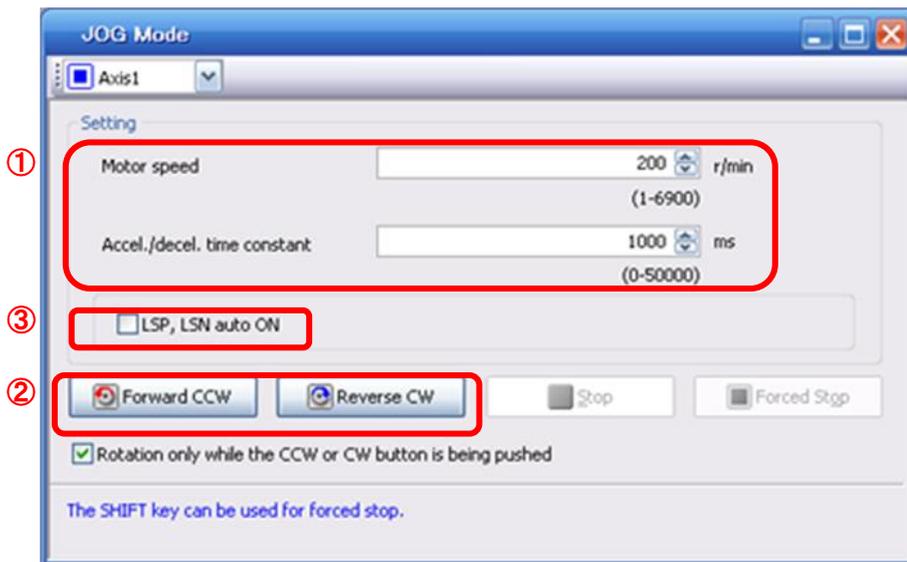
- ① The “JOG Mode” window can be displayed by selecting “Jog Mode” from the “Test Mode” menu in the setup software.
- ② Click “OK”.

(When using this function, all external input signal operation will be disabled. If controlling using a PLC or other upper device, please turn off the power and reset the device before use.)



## 5.4.1 JOG Mode

- ① In order to prevent accidental impact at the end of the stroke, test actuator operation at low speed. See “LESCS Operation Manual (Simplified Edition)”, section 5.6.2 for motor speed configuration. See “LESCS Operation Manual (Simplified Edition)”, section 5.6.3 for Acceleration/deceleration time.
- ② Check actuator JOG operation using [Forward (CCW)] and [Reverse (CW)] in JOG mode. (if operation is not correct, please check wiring and parameters).  
When performing JOG operation in the setup software, the rotation direction of the actuator does not change if you change the setting of parameter PA14 (Rotation direction selection).  
The actuator moves in the direction of [Forward (CCW)] button and [Reverse (CW)] button.
- ③ If the selection “LSP and LSN are automatically turned ON” is not checked, an alarm will occur (if checked, the stroke end signals (LSP & LSN) will be automatically turned ON when this window is open).



Item	Setting range	Unit	Description
Motorspeed	0 to allowable actuator speed	r/min	Set the command speed of the servo motor for execution of positioning ( <b>motor rotations/minute</b> ).
Acceleration/deceleration time	0 to 50000	ms	Set the time until the servo motor reaches/stops to the rated speed (3000 r/min).

## 5.5 Changing I/O Signal Allocation

Input/output signal assignment can be changed as appropriate from initial settings.

There may be cases when changes to the Input/output signal assignment are required for actuator operation. Please be aware that any changes will alter signals entered as initial settings.

Please allocate it according to your system specification.

\*When configuring PD\*\*, please set parameter write inhibit [PA19] to 000C.

See “LECSC Operation Manual”, section 6.4 for details.

Set parameters related to I/O: [PD06] to [PD11]

**PD06 to PD08 Input signal assignment (CN6-2 to CN6-4)**  
**PD09 to PD11 Output signal assignment (CN6-14 to CN6-16)**

### 5.5.1 Automatic Input Signal ON Selection Parameter Configuration

Configure the input signal automatic ON selection parameter.

The parameter “PD01/PD03:Input signal automatic ON selection 1/3” settings, defines which input signals will turn ON automatically when the control circuit power supply is turned on., doing this allows additional I/O signal selection range.

Please allocate it according to your system specification.

Configure the automatic ON selection in parameter [PD01], or configure the CC-Link or I/O signal layout.

**When wiring I/O signal or CC-Link remote input, do not set the corresponding signal in "PD01/PD03:Input signal automatic ON selection 1/3".**

**(Ex.)If the servo-on(SON) is automatically turned on with PD01, the actuator will always be in the servo-on state when the control circuit power supply is turned on.**

**Therefore, it is not possible to operate servo-on/servo-off from the I/O signal or CC-Link remote input.**

**\*If all CC-Link or I/O signal are controlled, please set PD01 to 0000.**

**When using it by the I/O signal (CN6 connector use), please match parameter PD12 and PD14.**

**See “LECSC Operation Manual (Simplified Edition)”, section 5.5.6.**

**For EMG(Forced stop), use I/O signal or automatic ON selection.**

**It cannot be used with CC-Link.**

Please configure PD01 : Input signal automatic ON selection in Hexadecimal (HEX).

During Actuator Operation: <Signals which must be ON during actuator operation>

Set PD01 as 1C04. The following signals will automatically turn on when power supply turns on.

SON	Servo-on	OFF: Servo-off ON : Servo-on (operational)
LSP	Forward rotaion Stroke end (normally closed contact)	OFF: Forward rotaion Stroke end ON : Forward rotaion Stroke end off (operational)
LSN	Reverse rotaion Stroke end (normally closed contact)	OFF: Reverse rotaion Stroke end ON : Reverse rotaion Stroke end off (operational)
EMG	Forced stop (normally closed contact)	OFF: Forced stop ON : Forced stop off (operational)

(1) PD01 : Input signal automatic ON selection 1

No.	Symbol	Name and function	Initial value	Unit
PD01	*DIA1	Input signal automatic ON selection 1 Select the input devices to be automatically turned ON. ☐ part is for manufacturer setting. Do not set the value by any means.	0000h	

Device name	Initial value	
	BIN	HEX
Servo-on (SON)	0	0

Device name	Initial value	
	BIN	HEX
Proportion control (PC)	0	0

Device name	Initial value	
	BIN	HEX
Forward rotation stroke end (LSP)	0	0
Reverse rotation stroke end (LSN)	0	0

Device name	Initial value	
	BIN	HEX
Forced stop (EMG)	0	0

BIN 0: Used in CC-Link or as external input signal.  
BIN 1: Automatic ON

For example, to turn ON SON, the setting is "☐☐☐4".

If you want to the SON to automatic ON

Binary number (BIN) "0100" to  
Hexadecimal (HEX) "4"

Binary number (BIN) "0000" to  
Hexadecimal (HEX) "0"

If you want to the LSP and LSN to automatic ON

Binary number (BIN) "1100" to  
Hexadecimal (HEX) "C"

If you want to the EMG to automatic ON

Binary number (BIN) "0001" to  
Hexadecimal (HEX) "1"

Binary number	Decimal	Hexadecimal
0 0 0 0	0	0
0 0 0 1	1	1
0 0 1 0	2	2
0 0 1 1	3	3
0 1 0 0	4	4
0 1 0 1	5	5
0 1 1 0	6	6
0 1 1 1	7	7
1 0 0 0	8	8
1 0 0 1	9	9
1 0 1 0	10	A
1 0 1 1	11	B
1 1 0 0	12	C
1 1 0 1	13	D
1 1 1 0	14	E
1 1 1 1	15	F

(1) PD03 : Input signal automatic ON selection 3

No.	Symbol	Name and function	Initial value	Unit
PD03	*DIA3	Input signal automatic ON selection 3 Select the input devices to be automatically turned ON. ☐ part is for manufacturer setting. Do not set the value by any means.	0000h	

Device name	Initial value	
	BIN	HEX
Automatic/manual selection (MD0)	0	0

BIN 0: Used in CC-Link or as external input signal.  
BIN 1: Automatic ON

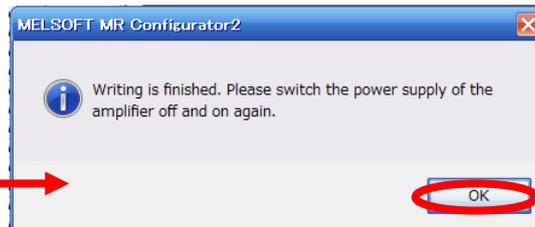
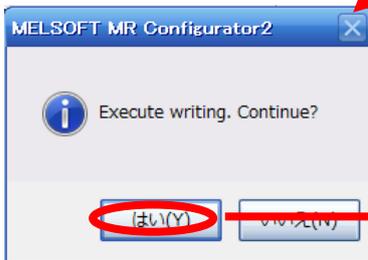
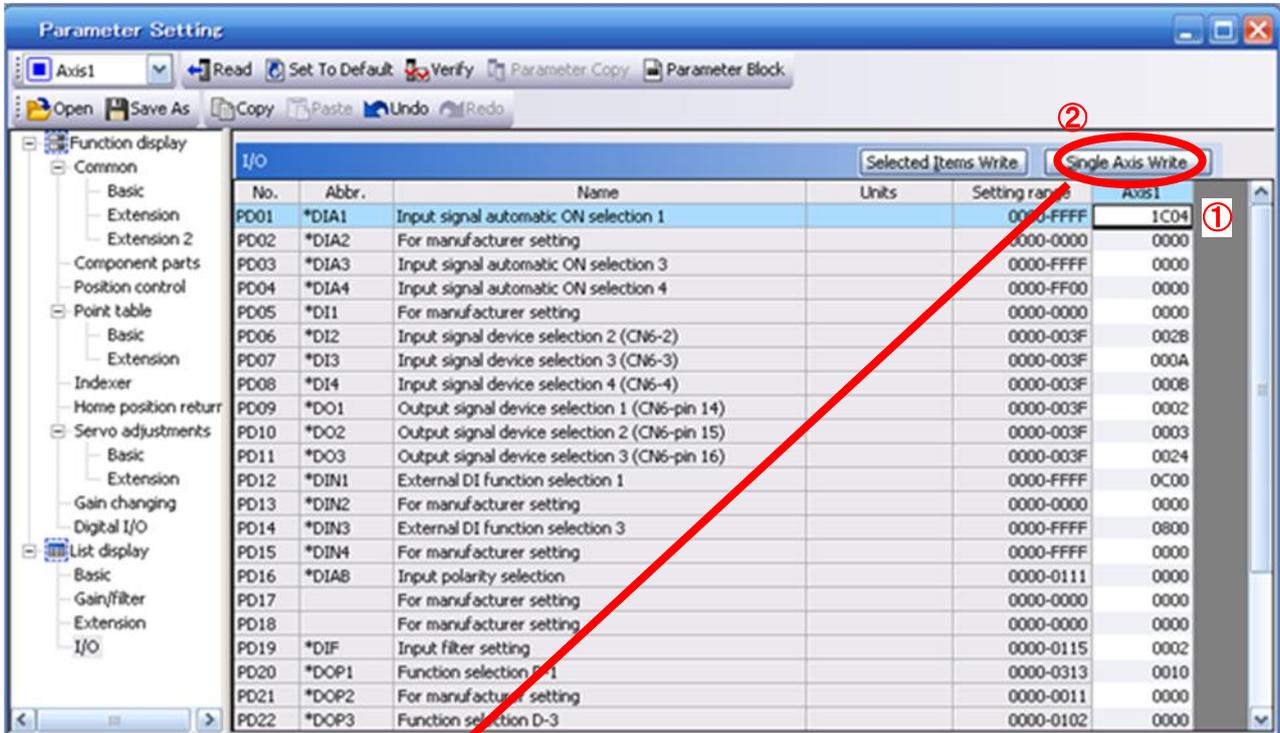
If you want to the MD0 to automatic ON

Binary number (BIN) "0001" to  
Hexadecimal (HEX) "1"

\* Enabling "Stroke end" (LSP, LSN), "Forced stop" (EMG) and "Servo-on" (SON) Signals

- ① Set to PD01 to 1C04 in the I/O setting tab.
- ② Click on the "Single Axis Write" button.
- ③ **Cycle the power for the changed Parameters to be enabled.**

\* In this configuration, the stroke end (LSP, LSN), forced stop (EMG) and servo-on (SON) signals will be ON automatically when the power is turned ON.



## 5.5.2 Initial I/O Signal Allocation

The initial (Default) allocation of I/O signals is shown below.

**PD06 to PD08 Input signal assignment (CN6-2 to CN6-4)**  
**PD09 to PD11 Output signal assignment (CN6-14 to CN6-16)**

Input signal points (4): (position control mode) and initial assignment

Device	Symbol	Connector pin No	I/O division	Parameters No.	Initial value
Forced stop	EMG	CN6-1	DI-1	(Fixed)	(Fixed)
Proximity dog	DOG	CN6-2	DI-1	PD06	002B
Forward rotation stroke end	LSP	CN6-3	DI-1	PD07	000A
Reverse rotation stroke end	LSN	CN6-4	DI-1	PD08	000B

Output signal points (3) (position control mode) and initial assignment

Device	Symbol	Connector pin No	I/O division	Parameters No.	Initial value
Ready	RD	CN6-14	DO-1	PD09	0002
Trouble	ALM	CN6-15	DO-1	PD10	0003
Home position return completion	ZP	CN6-16	DO-1	PD11	0024

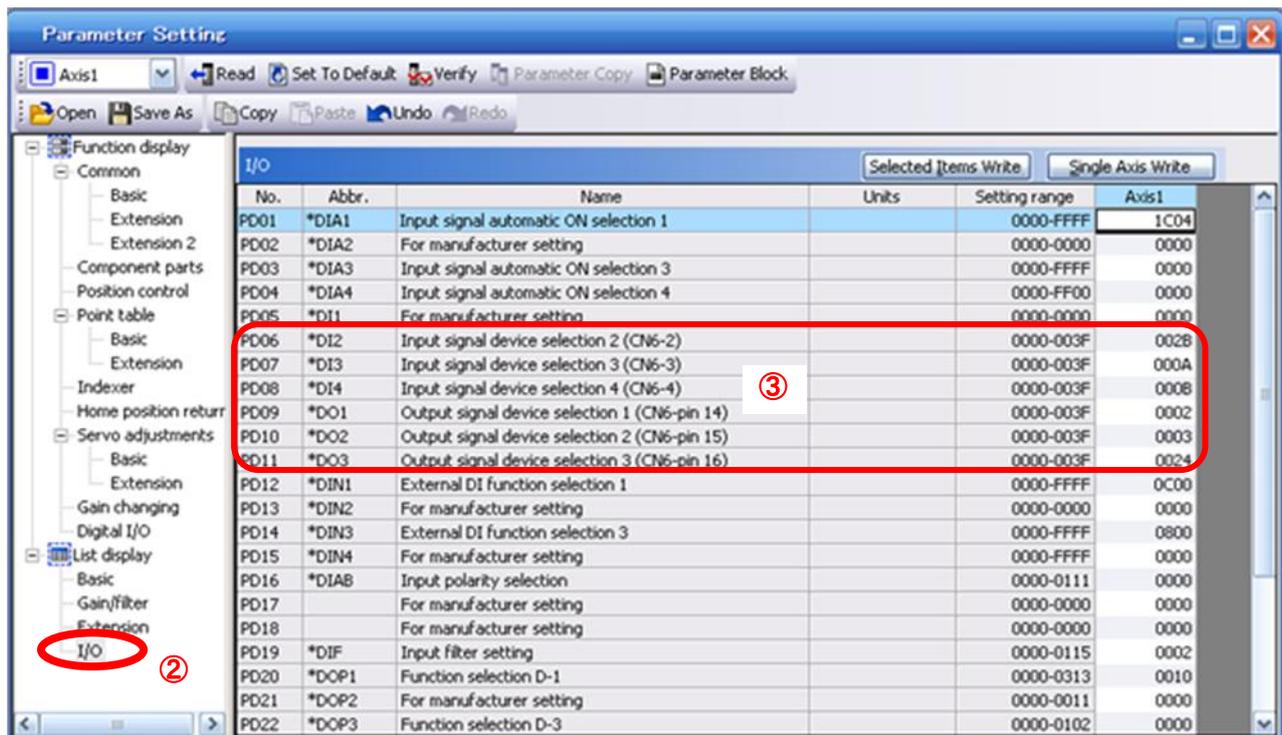
See “LESCS Operation Manual”, section 3.5.2 and “LESCS Operation Manual”, section 4.5 for details regarding signals.

See “LESCS Operation Manual”, section 6.4 for parameter configuration values.

\* Pins CN6-1 – CN6-4 (input signals) and CN6-14 – CN6-16 (output signals) can be allocated as current Sink (NPN) interface and current Source (PNP) interface wiring and I/O signal allocation.

## 5.5.3 Signal Allocation using Setup Software

- ① The “Parameter Setting” window will be displayed when “parameter list” is selected from the “parameters” menu in the setup software.
- ② Click the I/O tab.
- ③ When changing the allocation of signals, parameters for “PD06” - “PD11” can be altered.



## 5.5.4 Allocation Examples

### (1) Example of Clear (CR) Settings

Changing pins CN6-2 from Proximity dog (DOG) to Clear (CR).

Device	Symbol	Connector pin No	I/O division	Parameters No.	Initial value
Forced stop	EMG	CN6-1	DI-1	-	-
Proximity dog	DOG	CN6-2	DI-1	PD06	002B
Forward rotation stroke end	LSP	CN6-3	DI-1	PD07	000A
Reverse rotation stroke end	LSN	CN6-4	DI-1	PD08	000B

➔

Device	Symbol	Connector pin No	I/O division	Parameters	Initial value
Forced stop	EMG	CN6-1	DI-1	-	-
Clear	CR	CN6-2	DI-1	PD06	002B →0006
Forward rotation stroke end	LSP	CN6-3	DI-1	PD07	000A
Reverse rotation stroke end	LSN	CN6-4	DI-1	PD08	000B

#### ① Changing PD06 from 002B to 0006

No.	Symbol	Name and function				
PD06	*DI2	Output signal device selection 2 (CN6-2) Any input device can be assigned to the CN6-2 pin.				
		<table border="1" style="display: inline-table;"> <tr> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">0</td> <td style="width: 20px; text-align: center;">6</td> </tr> </table>	0	0	0	6
0	0	0	6			
		Select the input device of the CN6-2 pin				

Setting (Note)	Input device	
	Name	Abbreviation
00	No assignment function	
02	Servo-on	SON
03	Reset	RES
04	Proportion control	PC
06	Clear	CR
07	Forward rotation start	ST1
08	Reverse rotation start	ST2
09	Internal torque limit selection	TL1
0A	Forward rotation stroke end	LSP
0B	Reverse rotation stroke end	LSN
0D	Gain changing	CDP
20	Automatic/manual selection	MD0
24	Manual pulse generator multiplication 1	TP0
25	Manual pulse generator multiplication 2	TP1
27	Temporary stop/restart	TSTP
2B	Proximity dog	DOG

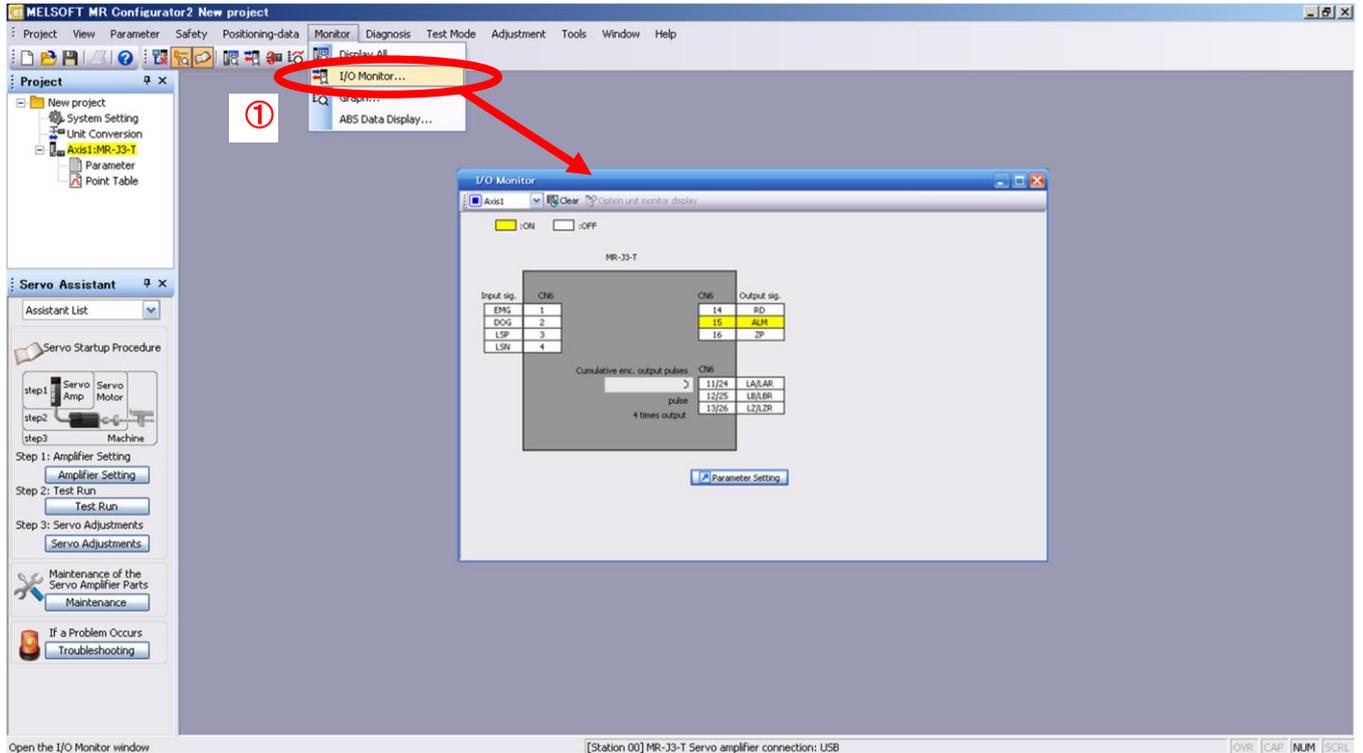
Note. The other setting values than shown in this table are for manufacturer setting.



## 5.5.5 I/O Signal Allocation Check

The ON/OFF state (including layout check) and signal names allocated to CN6 can be checked. When parameters for PD06 - PD11 have been changed, It is necessary to confirm these are correctly assigned.

- ① From the Monitor menu of the Setup Software select I/O Monitor. The I/O Monitor window opens and displays the inputs and outputs that are applicable. The highlighted background implies the signals are active.



### 5.5.6 Parameter setting when using it by I/O signal (CN6 connector use)

Please configure PD12: External DI function selection 1 and PD14: External DI function selection 3 in Hexadecimal (HEX).

When using signal of the servo on (SON) by the I/O signal (CN6)

PD12 DIN1 External DI function selection 1  
This function sets any signal imported from the CN6 connector.  
part is for manufacturer setting. Do not set the value by any means.

Device name	Initial value	
	BIN	HEX
Servo-on (SON)	0	0
Reset (RES)	0	0

→ 0100 4 in HEX

Device name	Initial value	
	BIN	HEX
Proportion control (PC)	0	0
Clear (CR)	0	0
Forward rotation start (ST1)	0	0

→ 0000 0 in HEX

Device name	Initial value	
	BIN	HEX
Reverse rotation start (ST2)	0	C
Internal torque limit (TL1)	0	C
Forward rotation stroke end (LSP)	1	C
Reverse rotation stroke end (LSN)	1	C

→ 1100 C in HEX

Device name	Initial value	
	BIN	HEX
Gain changing (CDP)	0	0

→ 0000 0 in HEX

BIN 0: Used in CC-Link  
BIN 1: Used in CN6 external input signal

Binary number → Decimal / Hexadecimal

Binary number	Decimal	Hexadecimal
0 0 0 0	0	0
0 0 0 1	1	1
0 0 1 0	2	2
0 0 1 1	3	3
0 1 0 0	4	4
0 1 0 1	5	5
0 1 1 0	6	6
0 1 1 1	7	7
1 0 0 0	8	8
1 0 0 1	9	9
1 0 1 0	10	A
1 0 1 1	11	B
1 1 0 0	12	C
1 1 0 1	13	D
1 1 1 0	14	E
1 1 1 1	15	F

When using signal of the Automatic/manual selection (MD0) by the I/O signal (CN6)

PD14 DIN3 External DI function selection 3  
This function sets any signal imported from the CN6 connector.  
part is for manufacturer setting. Do not set the value by any means.

Device name	Initial value	
	BIN	HEX
Automatic/manual selection (MD0)	0	0

→ 0001 1 in HEX

Device name	Initial value	
	BIN	HEX
Temporary stop/Restart (TSTP)	0	0

→ 0000 0 in HEX

Device name	Initial value	
	BIN	HEX
Proximity dog (DOG)	1	8

→ 1000 8 in HEX

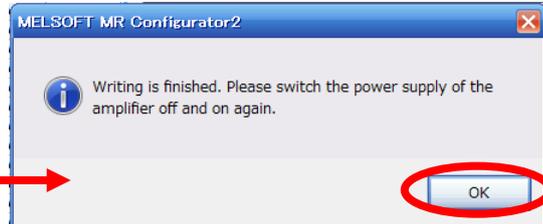
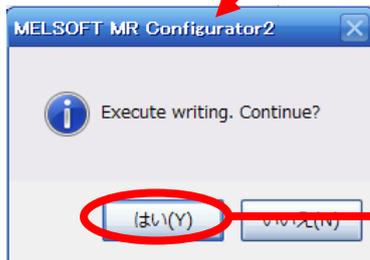
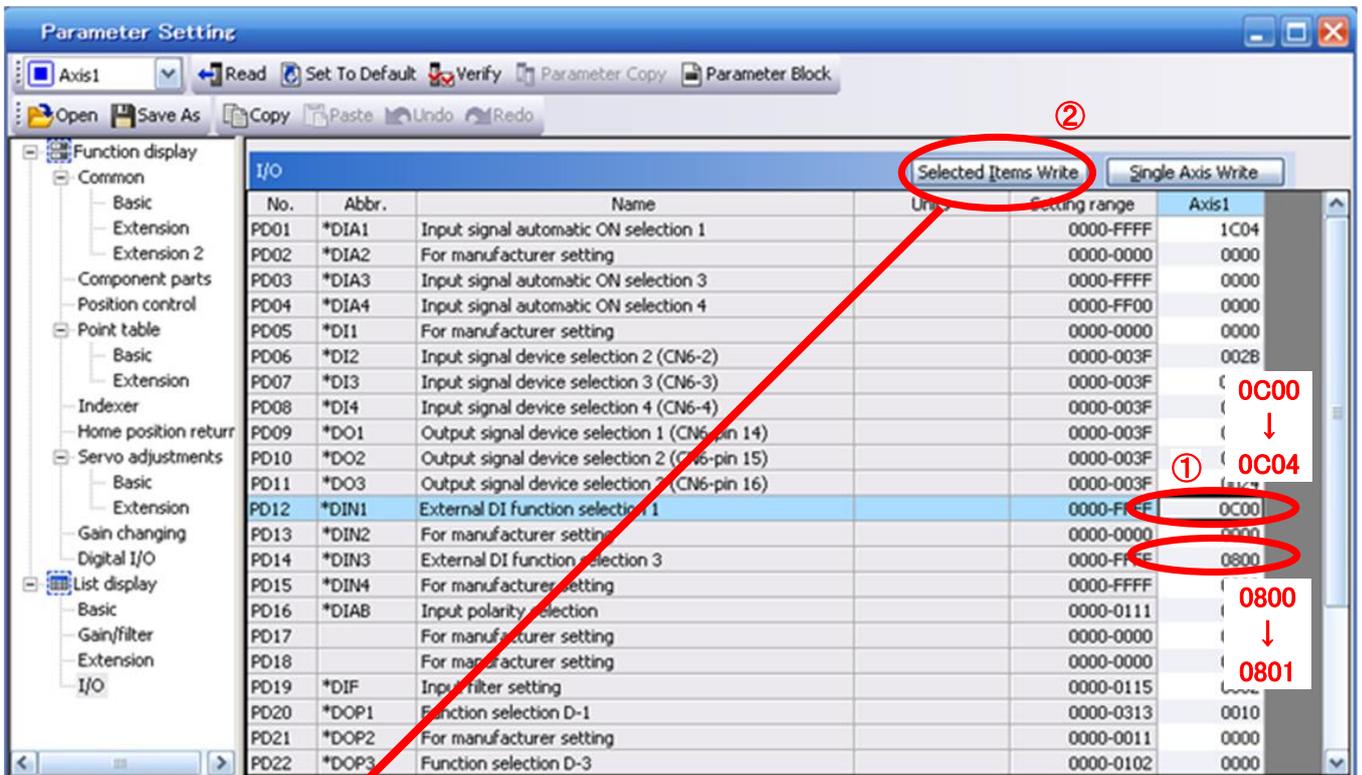
BIN 0: Used in CC-Link  
BIN 1: Used in CN6 external input signal

Binary number → Decimal / Hexadecimal

Binary number	Decimal	Hexadecimal
0 0 0 0	0	0
0 0 0 1	1	1
0 0 1 0	2	2
0 0 1 1	3	3
0 1 0 0	4	4
0 1 0 1	5	5
0 1 1 0	6	6
0 1 1 1	7	7
1 0 0 0	8	8
1 0 0 1	9	9
1 0 1 0	10	A
1 0 1 1	11	B
1 1 0 0	12	C
1 1 0 1	13	D
1 1 1 0	14	E
1 1 1 1	15	F

\* Enabling "Servo-on" (SON) and "Automatic/manual selection" (MD0) Signals

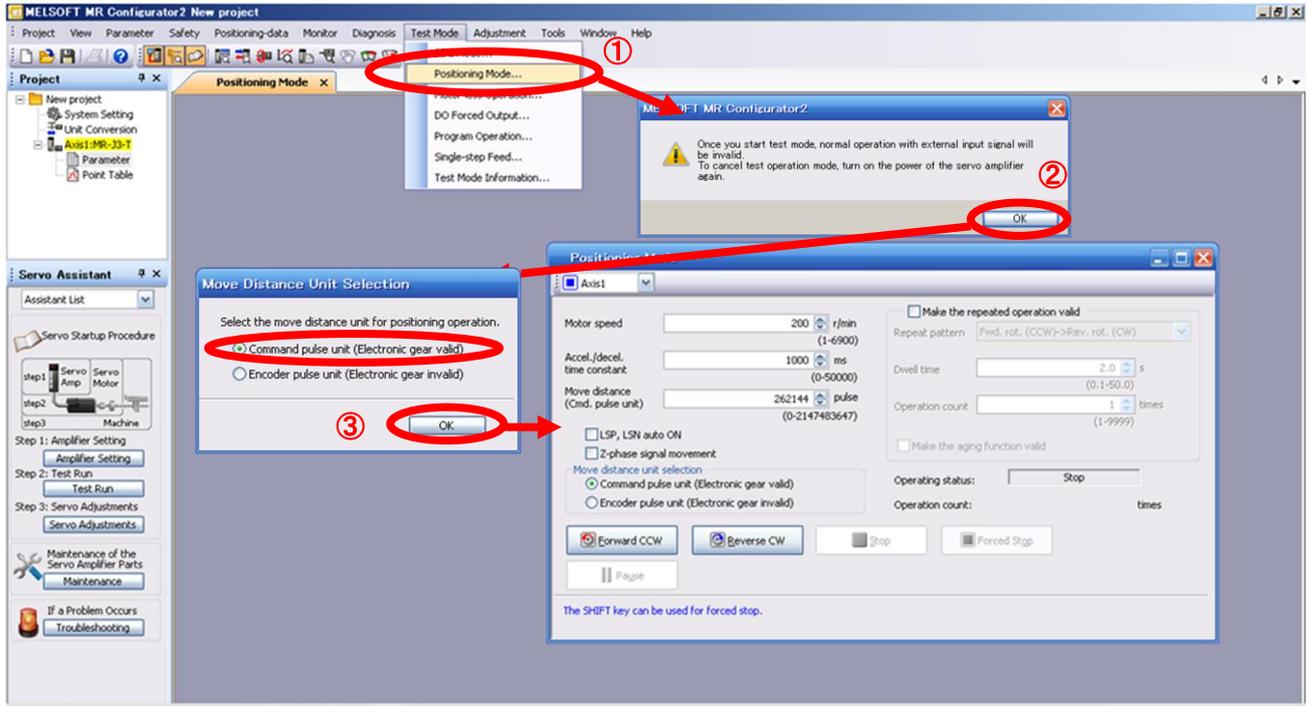
- ① Set PD12 to 0C04 and PD14 to 0801 in the I/O setting tab.
- ② Click on the "Single Axis Write" button.
- ③ **Cycle the power for the changed Parameters to be enabled.**



\* This setting should allocate CN6 each input signal according to the I/O signal used. See "LESCS Operation Manual", section 6.4 for details.

## 5.6 Positioning Mode in Setup Software

- ① From the Test Mode menu of the Setup Software select Positioning Mode. The Move Distance Unit Selection window opens.
- ② Click OK.  
(When using this function, external input signal operation will be disabled. When controlling from a PLC or upper level device, the power must be turned off and then on.)
- ③ Check Command pulse unit (Electronic gear valid) and click OK.  
Electronic gear ratio that is set in the PA05 / PA06 / PA07 is enabled.
- ④ The Positioning Mode window opens.



### 5.6.1 Positioning Mode

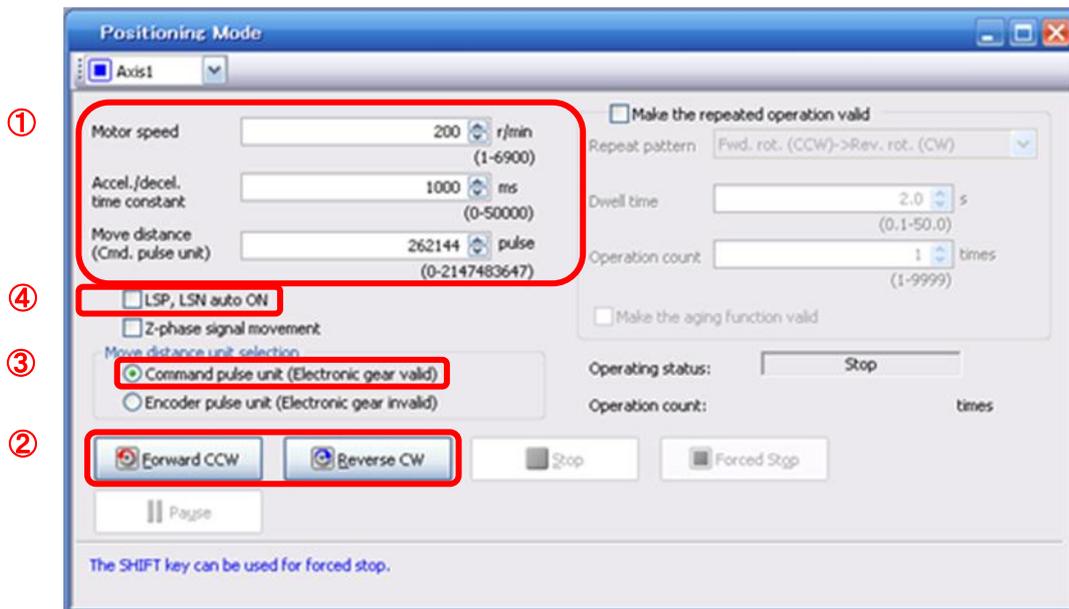
- ① In order to prevent accidental impact at the end of the stroke, operate the actuator at a low speed initially. When changing speed or movement, increase the values whilst checking operation (Change motor speed, acceleration/deceleration time, movement distance values if required).  
See “LECSC Operation Manual (Simplified Edition)”, section 5.6.2 for motor speed configuration.  
See “LECSC Operation Manual (Simplified Edition)”, section 5.6.3 for acceleration/deceleration time configuration.  
See “LECSC Operation Manual (Simplified Edition)”, section 5.6.4 for movement distance configuration.
- ② Actuator positioning operates using [Forward (CCW)] and [Reverse (CW)].  
(Check wiring and parameters if operation cannot be performed correctly).  
When performing positioning operation in the setup software, the rotation direction of the actuator does not change if you change the setting of parameter PA14 (Rotation direction selection). The actuator moves in the direction of [Forward (CCW)] button and [Reverse (CW)] button.
- ③ Check the command impulse unit (electronic gear enabled).  
The electronic gear duty set to PA06/PA07 will be enabled.

See “LECSC Operation Manual (Simplified Edition)”, section 5.3.4 – “Parameter Values by Actuator Model” for PA06/PA07 settings for each actuator.

If PA06/PA07 are set to the values in “LECSC Operation Manual (Simplified Edition)”, section 5.3.4– Parameter Values by Actuator Model, the travel distance of the actuator per 1 pulse will be calculated as follows.

• travel distance of the actuator per 1 pulse = 1[μm] ( 0.001[mm])

- ④ If the “Stroke-end” (LSP, LSN) signal is not configured as ON, an alarm may occur. (When checked, the “stroke-end” (LSP, LSN) will be automatically turned ON only when this window is open.)



Item	Setting range	Unit	Description
Motor speed	0 to Allowed Speed for each actuator	r/min	Set the command speed of the servo motor for execution of positioning ( <b>Motor rotations/min</b> ).
Acceleration/deceleration time	0 to 50000	ms	Set the time until the servo motor reaches/stops to the rated speed ( <b>3000 r/min</b> ).
Move distance	0 to 99999999	pulse	Sets movement distance.

## 5.6.2 Motor speed Configuration

### <Rotation Speed Configuration>

- ① Motor speed (r/min) configuration.  
\* r/min (rpm): Indicated motor rotation speed (motor rotations/min)

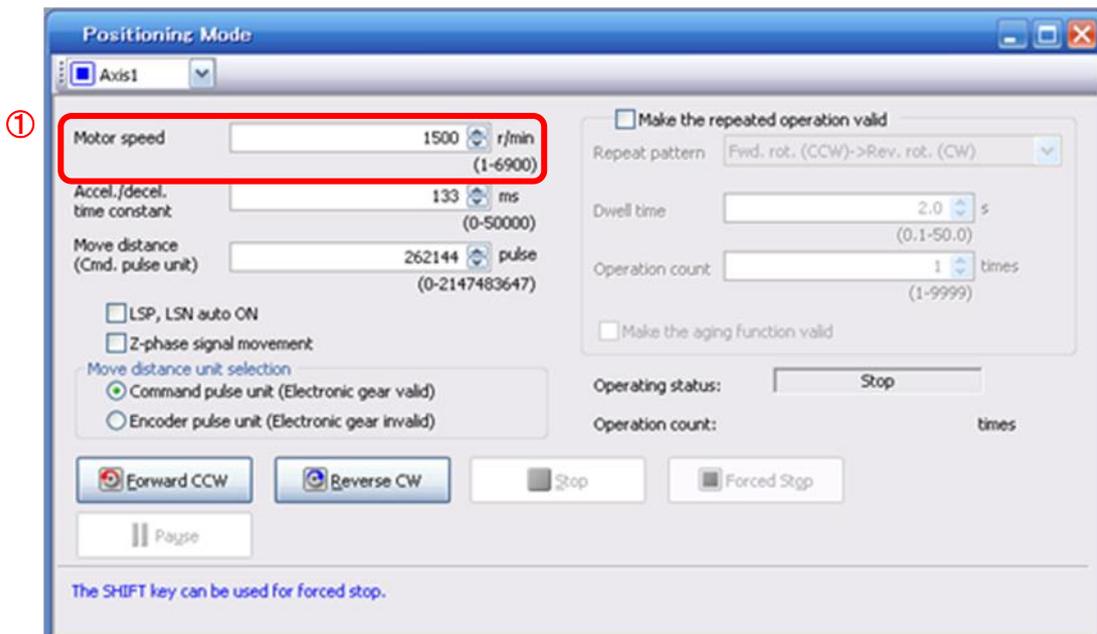
Rotation speed must be between 0 and the allowable speed limit for each actuator. Please be aware that the actuator will not operate if this is set to 0.

If the rotation speed is too low, this may cause vibration; check the actuator while changing settings.

Movement speed (mm/s) must be converted into rotation speed (r/min).  
See below for the conversion formula.

Calculating motor speed conversion example using an actuator with a 20mm lead and 500[mm/sec] speed.

$$\begin{aligned}
 & \text{Rotations per Second} \\
 & \text{Distance of movement per second} \div \text{Distance of movement per rotation} \\
 \text{Rotation Speed (rpm)} &= \text{Speed (mm/s)} \div \text{Lead (mm)} \times 60 (\text{s}) \\
 &= \{500 (\text{mm/s}) \div 20 (\text{mm})\} \times 60 (\text{s}) = 1500 (\text{rpm})
 \end{aligned}$$



## 5.6.3 Acceleration/deceleration Time Configuration

### < Acceleration/deceleration Time Configuration >

- ① Acceleration/deceleration time (ms) configuration:

The acceleration/deceleration time sets the amount of time (ms) in which a prescribed rotation speed(3000[r/min]) is reached.

The acceleration/deceleration time must be set to a value between 0 and the allowable acceleration/deceleration speed for each actuator.

The acceleration/deceleration time must be converted from the acceleration/deceleration speed. See below for the conversion formula.

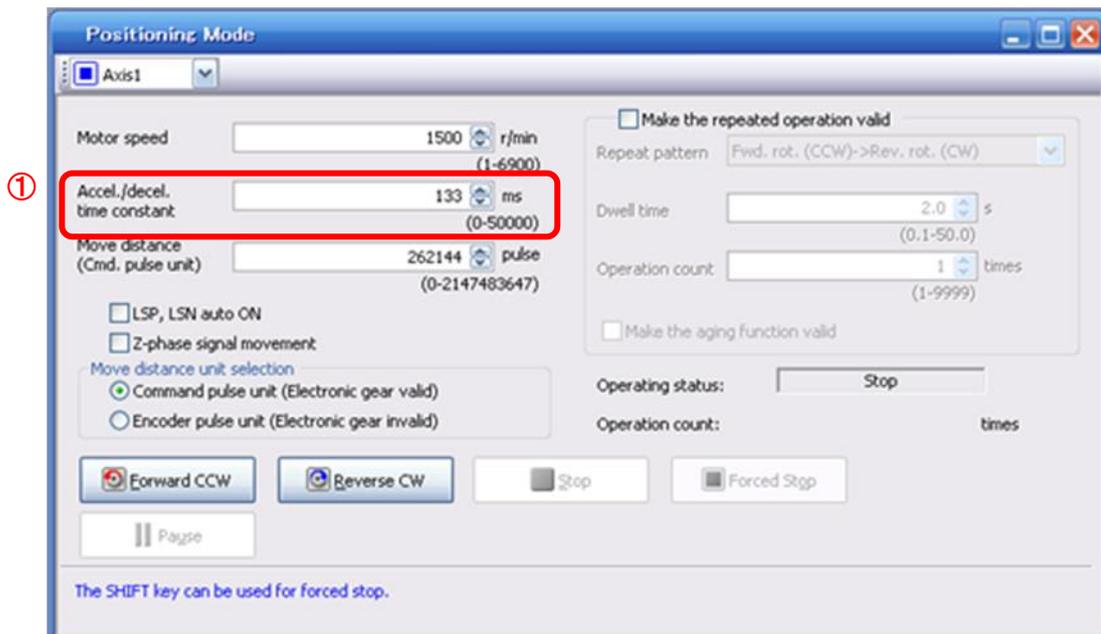
Calculating Acceleration/deceleration conversion example using an actuator with a 8 [mm] lead with an acceleration of 3000[mm/sec<sup>2</sup>].

### Speed at a rated motor rotation of 3000rpm

$$\text{Accel./decel time (ms)} = \frac{\{\text{Rated Rotation Speed (r/min)} \div 60 \text{ (S)}\} \times \text{Screw Lead (mm)} \times 1000}{\text{Acceleration/deceleration speed (mm/s}^2\text{)}}$$

**\*Acceleration speed is measured in ms, so this must be calculated as (s) ×1000**

$$\begin{aligned} \text{Acceleration/deceleration time (ms)} &= \frac{\{3000 \text{ (r/min)} \div 60 \text{ (S)}\} \times 8 \text{ (mm)} \times 1000}{3000 \text{ (mm/s}^2\text{)}} \\ &= 133 \text{ (ms)} \end{aligned}$$



## 5.6.4 Move distance Configuration and Operation

### < Move distance Configuration >

- ① Set the move distance [pulse]. Select a value within the stroke range.
- ② Actuator position will operate using [Forward (CCW)], [Reverse (CW)].  
The position at which power is turned ON will be set as the home position, and the actuator will travel the amount set as move distance (check wiring and parameters If operation is not performed correctly).  
When performing positioning operation in the setup software, the rotation direction of the actuator does not change if you change the setting of parameter PA14 (Rotation direction selection). The actuator moves in the direction of [Forward (CCW)] button and [Reverse (CW)] button.
- ③ Check command input pulse units (electronic gear enabled).  
The electronic gear duty configured in PA06/PA07 will be enabled. See “LESCS Operation Manual (Simplified Edition)”, section 5.3.4 for setting values for PA06/PA07 in each actuator. If parameters PA06/PA07 are set according to “LESCS Operation Manual (Simplified Edition)”, section 5.3.4, the travel distance of the actuator per 1 pulse will be as follows.

• travel distance of the actuator per 1 pulse = 1[μm] ( 0.001[mm])

Travel distance (mm) must be converted to tavel distance (pulse).  
See below for the conversion formula.

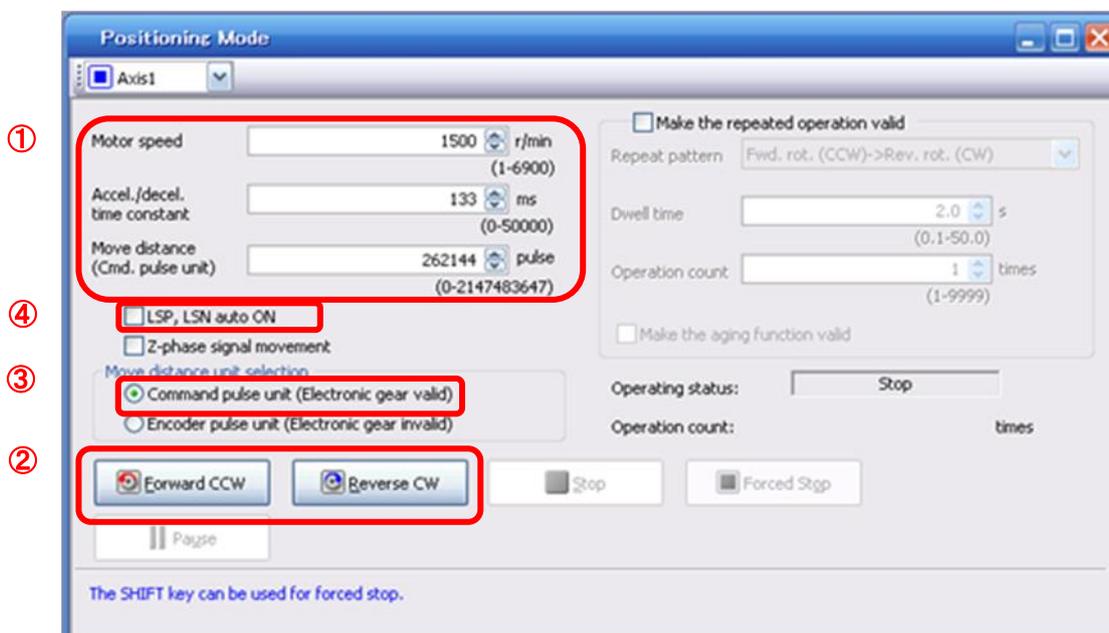
As an example, for a travel of 100m;

Travel distance of the actuator per 1 pulse = 0.001 (mm) \*1  
 $100 \text{ (mm)} / 0.001 \text{ (mm)} = 100000 \text{ (pulse)}$

\*1 The travel distance of the actuator per 1 pulse is set according to the electronic gears (PA06/PA07) outlined in 5.3.4 “Recommended Parameter Values by Actuator Model”.

- ④ If the stroke end signals (LSP, LSN) are not turned ON, an alarm may occur. (If checked, the stroke end (LSP, LSN) signals will be turned ON automatically only when this window is open).

\* Ensure that the [Forward (CCW)] and [Reverse (CW)] driving directions are checked. If the driving direction is unclear, operate the actuator slowly with a small move distance while checking the driving direction.



## 5.7 Positioning (Point Table) Operation using the Setup Software

This feature is only available in positioning (point table) mode.

When positioning using the positioning (point table) mode, the point table (target position, speed data, acceleration time, deceleration time etc.) must be configured.

(There are 31 points of point tables to be used when 1 station is occupied and 255 points when 2 stations are occupied.)

### 5.7.1 Point table List

- ① Using the “Positioning Data” menu in the setup software. The “Point table list” can be opened by selecting “Point Table”
- ② “Read” : point table data will be read from the LECSC and displayed.
- ③ “Write All” : point table data will be written to the LECSC.

The screenshot shows the MELSOFT MR Configurator2 software interface. The 'Point Table...' menu item is circled in red with a red arrow pointing to the 'Point Table' window. In the 'Point Table' window, the 'Read' button is circled in red with a red arrow, and the 'Write All' button is also circled in red with a red arrow. The window displays a table of point data for Axis 1.

No.	Target position mm	Rotation speed r/min	Accel. time const. ms	Decel. time const. ms	Dwell time ms	Auxiliary func. 0-3	M code 0-99
1	0.000	0	0	0	0	0	0
2	0.000	0	0	0	0	0	0
3	0.000	0	0	0	0	0	0
4	0.000	0	0	0	0	0	0
5	0.000	0	0	0	0	0	0
6	0.000	0	0	0	0	0	0
7	0.000	0	0	0	0	0	0
8	0.000	0	0	0	0	0	0
9	0.000	0	0	0	0	0	0
10	0.000	0	0	0	0	0	0
11	0.000	0	0	0	0	0	0
12	0.000	0	0	0	0	0	0
13	0.000	0	0	0	0	0	0
14	0.000	0	0	0	0	0	0

## 5.7.2 Point table Data

By parameters "PA01:Control mode" settings, registration method of data of the point table is different.

(1) If the parameter "PA01:Control mode" setting is "0000:Absolute value command system".

Item	Setting range	Unit	Description
Position data (Target Position)	-999.999 to 999.999	$\times 10^{\text{STM}}$ mm	(1) When using this point table as an absolute value command system, set the target address (absolute value). (2) When using this point table as an incremental value command system, set the travel distance. A "-" sign indicates a reverse rotation command. <b>Number of decimal places changes according to PA05:STM (Feed length multiplication)</b>
Servo motor speed (Rotation speed)	0 to allowable actuator speed	r/min	Sets the command rotation speed ( <b>Motor rotations/min</b> ) when positioning is executed. Please set within allowable speed of each actuator.
Acceleration time constant	0 to 20000	ms	Set the time until the servo motor reaches the rated speed. <b>(3000 r/min)</b> Please set within allowable deceleration time constant of each actuator.
Deceleration time constant	0 to 20000	ms	Set the time until the servo motor slows down to the rated speed. <b>(3000 r/min)</b> Please set within allowable deceleration time constant of each actuator.
Dwell time	0 to 20000	ms	When dwell is set and the set dwell has passed after the position command of the selected point table is completed, the position command of the next point table is started. Set "0" in the auxiliary function to make the dwell invalid. Set "1" in the auxiliary function and 0 in the dwell to perform varied speed operation.
Auxiliary function	0 to 3		(1) When using this point table in the absolute value command system 0: Automatic operation is performed in accordance with a single point table chosen. 1: Operation is performed in accordance with consecutive point tables without a stop. (2) When using this point table in the incremental value command system 2: Automatic operation is performed in accordance with a single point table chosen. 3: Operation is performed in accordance with consecutive point tables without a stop. When a different rotation direction is set, smoothing zero (command output) is confirmed and the rotation direction is then reversed. Setting "1" or "3" in point table No. 255 results in an error.
M code	Do not change.		

(2) If the parameter "PA01:Control mode" setting is "0001:Incremental value command system".

Item	Setting range	Unit	Description
Position data (Target Position)	0 to 999.999	$\times 10^{\text{STM}}$ mm	Set the travel distance. <b>Number of decimal places changes according to PA05:STM (Feed length multiplication)</b>
Servo motor speed (Rotation speed)	0 to allowable actuator speed	r/min	Sets the command rotation speed ( <b>Motor rotations/min</b> ) when positioning is executed. Please set within allowable speed of each actuator.
Acceleration time constant	0 to 20000	ms	Set the time until the servo motor reaches the rated speed. <b>(3000 r/min)</b> Please set within allowable deceleration time constant of each actuator.
Deceleration time constant	0 to 20000	ms	Set the time until the servo motor slows down to the rated speed. <b>(3000 r/min)</b> Please set within allowable deceleration time constant of each actuator.
Dwell time	0 to 20000	ms	When dwell is set and the set dwell has passed after the position command of the selected point table is completed, the position command of the next point table is started. Set "0" in the auxiliary function to make the dwell invalid. Set "1" in the auxiliary function and 0 in the dwell to perform varied speed operation.
Auxiliary function	0, 1		This function is valid when the point table is selected using the input signal or the remote input of CC-Link. It cannot be used when the point table No. is selected using the remote register of CC-Link. 0: Automatic operation is performed in accordance with a single point table chosen. 1: Operation is performed in accordance with consecutive point tables without a stop. When a different rotation direction is set, smoothing zero (command output) is confirmed and the rotation direction is then reversed. Setting "1" in point table No.255 results in an error. For full information, refer to (4) in this section.
M code	Do not change.		

### 5.7.3 Point table (Target position) Configuration

#### < Target position Configuration >

① Please set the parameters as "PA05 (Feed function selection)" and "Feed length multiplication (STM) (Multiplier)".

Please change the "PA05 (Feed function selection)".

" Feed length multiplication (STM) (Multiplier)" will be automatically scaled.

**For actuators with a stroke less than 1000mm, set** parameter "PA05 (Feed function selection)" to 0000 and the "Feed length multiplication (STM) (Multiplier)" value to x1.

**For actuators with a stroke more than 1000mm, set** parameter "PA05 (Feed function selection)" to 0001 and the "Feed length multiplication (STM) (Multiplier)" value to x10.

Set the feed length multiplication (STM) (Multiplier) of target position in parameter No. PA05 (Feed function selection).

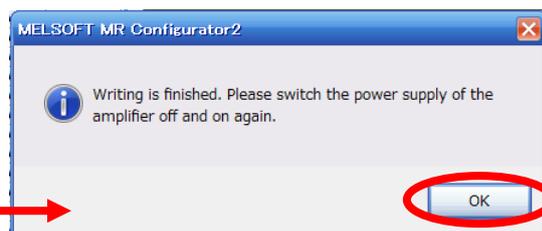
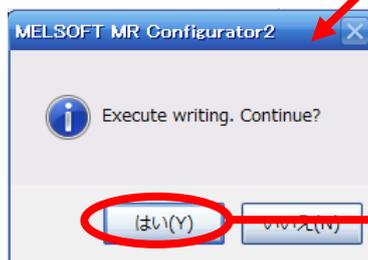
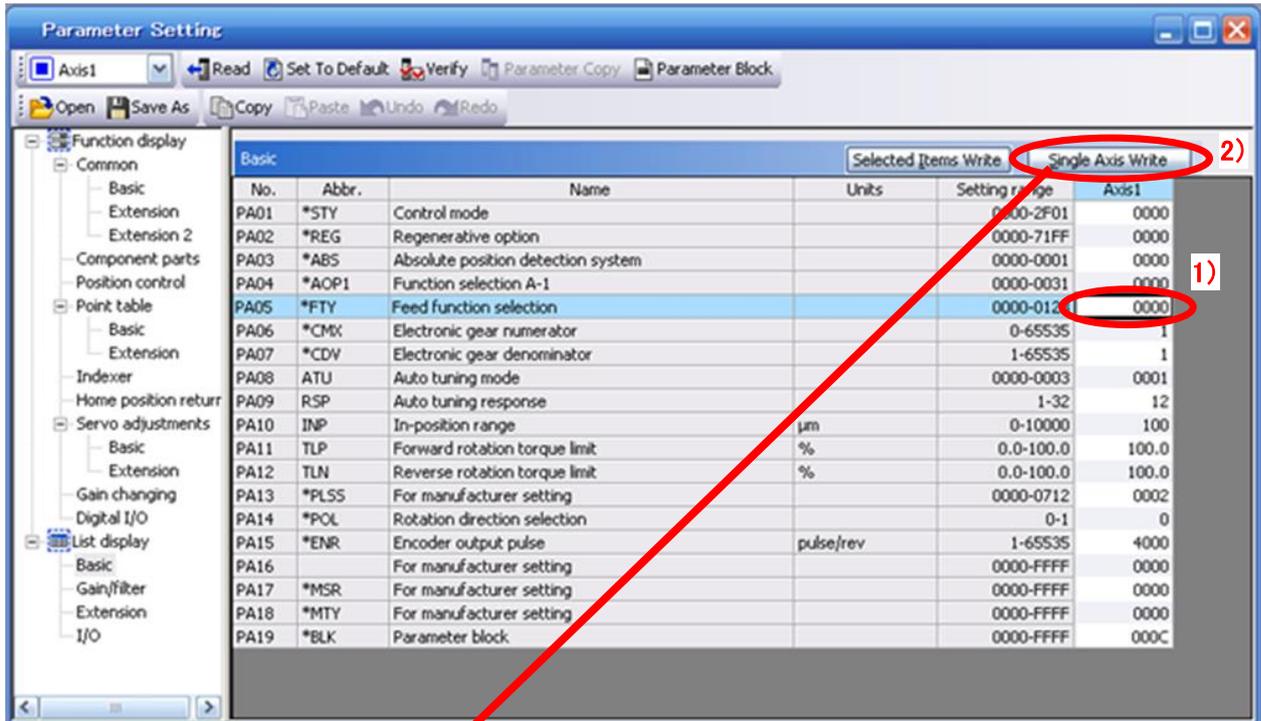
Parameter No. PA05 setting	Feed length multiplication (STM) (Multiplier) (Feed unit [ $\mu$ m])	Target position input range [mm]
□□□0	1	-999.999 to +999.999
□□□1	10	-9999.99 to +9999.99
□□□2	100	-99999.9 to +99999.9
□□□3	1000	-999999 to +999999

Change of **parameter [PA05(Feed function selection)]**.

1) Set the parameters of the PA05 in the "Positioning setting" tab.

2) Click on the "Single Axis Write" button.

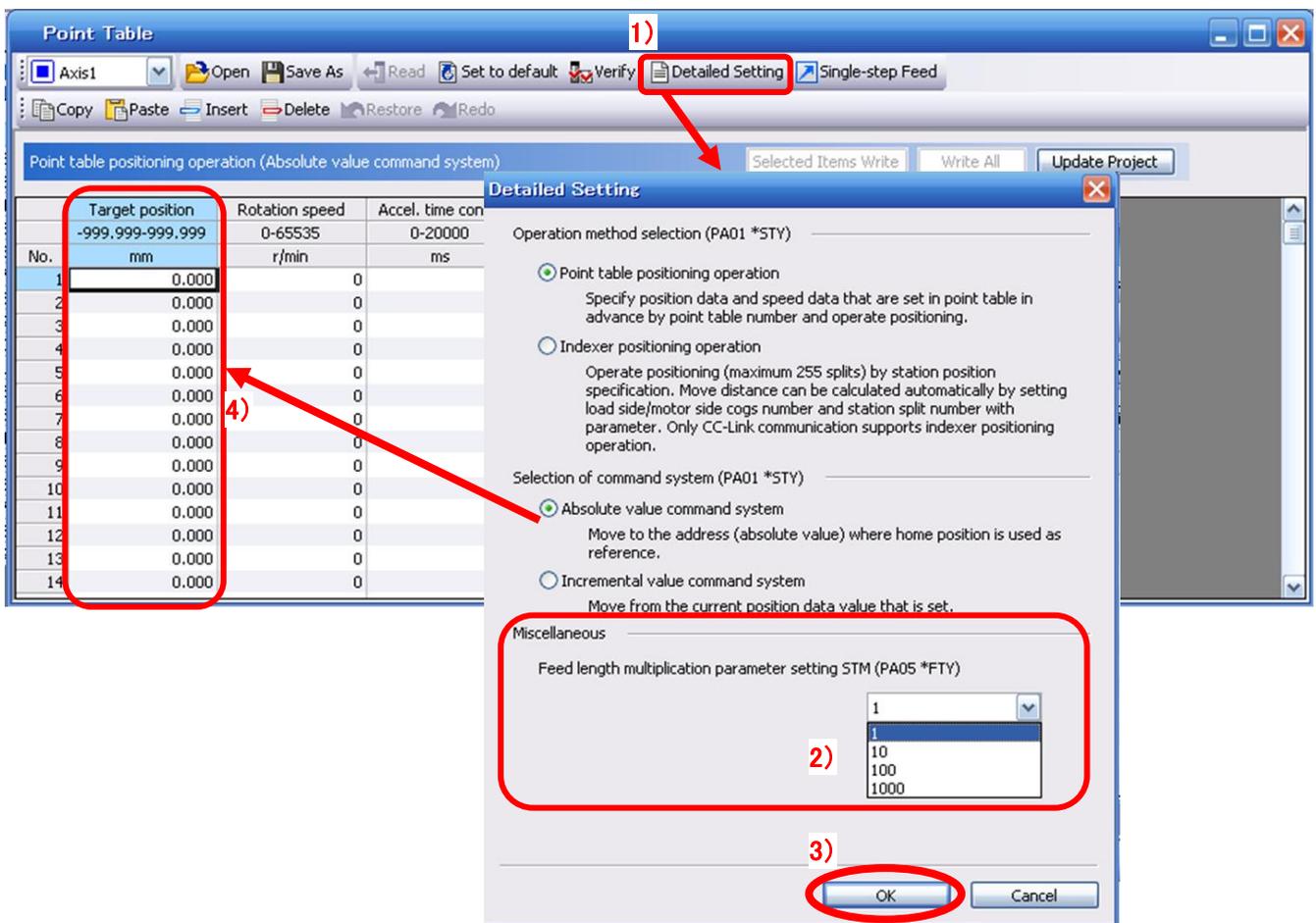
3) **Turn the power OFF and ON again. The Parameter is then enabled.**



## Change of the target position input range

- 1) Please click on the [Detailed Setting] button in the [Point Table] tab.
- 2) Please confirmation or change of **[Feel length multiplication (STM) (Multiplier)]**.
- 3) Click on the "OK" button.
- 4) Target position input range varies depending on the set value of **[Feel length multiplication (STM) (Multiplier)]**.

Feed length multiplication (STM) (Multiplier) (Feed unit [ $\mu\text{m}$ ])	Target position input range [mm]
1	-999.999 to +999.999
10	-9999.99 to +9999.99
100	-99999.9 to +99999.9
1000	-999999 to +999999



**For actuators with a stroke less than 1000mm, set** parameter "PA05 (Feed function selection)" to 0000 and the "Feed length multiplication (STM) (Multiplier)" value to x1.

**For actuators with a stroke more than 1000mm, set** parameter "PA05 (Feed function selection)" to 0001 and the "Feed length multiplication (STM) (Multiplier)" value to x10.

② Configure position data (mm). Set to a value within the stroke range.

No.	Target position mm	Rotation speed r/min	Accel. time const. ms	Decel. time const. ms	Dwell time ms	Auxiliary func. 0-3	M code 0-99
	-999,999-999,999	0-65535	0-20000	0-20000	0-20000	0-3	0-99
1	0.000	0	0	0	0	0	0
2	500.000	0	0	0	0	0	0
3	900.000	0	0	0	0	0	0
4	0.000	0	0	0	0	0	0
5	0.000	0	0	0	0	0	0
6	0.000	0	0	0	0	0	0
7	0.000	0	0	0	0	0	0
8	0.000	0	0	0	0	0	0
9	0.000	0	0	0	0	0	0
10	0.000	0	0	0	0	0	0
11	0.000	0	0	0	0	0	0
12	0.000	0	0	0	0	0	0
13	0.000	0	0	0	0	0	0
14	0.000	0	0	0	0	0	0

\* If electronic gear parameters (PA06/PA07) are set according to “LESC Operation Manual (Simplified Edition)”, section 5.3.4.

The smallest unit for actuator movement is 1[μm] (0.001[mm]).

## 5.7.4 Point table (Servo Motor Speed) Configuration

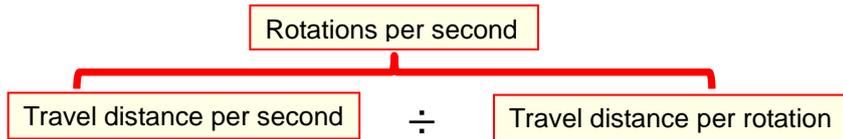
### <Rotation Speed Configuration>

- ① Rotation speed configuration:

\*r/min (rpm): motor command rotation speed (motor rotations/min)

Travel speed (mm/s) must be converted into rotation speed (r/min).  
See below for the conversion formula.

Example using a 20[mm] Lead Actuator with target travel speed of 500[mm/sec]



$$\begin{aligned} \text{Rotation Speed (rpm)} &= \{\text{Speed (mm/s)} \div \text{Lead (mm)}\} \times 60 \text{ (S)} \\ &= \{500 \text{ (mm/s)} \div 20 \text{ (mm)}\} \times 60 \text{ (s)} = 1500 \text{ (rpm)} \end{aligned}$$

The rotation speed must be a value between 0 and the allowable actuator speed. The actuator will not operate if set to 0.

Too low rotation speed (r/min), may cause vibration (resonance);

No.	Target position mm	Rotation speed 0-65535 r/min	Accel. time const. 0-20000 ms	Decel. time const. 0-20000 ms	Dwell time 0-20000 ms	Auxiliary func. 0-3	M code 0-99
1	0.000	1500	0	0	0	0	0
2	500.000	1500	0	0	0	0	0
3	900.000	1500	0	0	0	0	0
4	0.000	0	0	0	0	0	0
5	0.000	0	0	0	0	0	0
6	0.000	0	0	0	0	0	0
7	0.000	0	0	0	0	0	0
8	0.000	0	0	0	0	0	0
9	0.000	0	0	0	0	0	0
10	0.000	0	0	0	0	0	0
11	0.000	0	0	0	0	0	0
12	0.000	0	0	0	0	0	0
13	0.000	0	0	0	0	0	0
14	0.000	0	0	0	0	0	0

### 5.7.5 Point Table (Acceleration time constant/Deceleration time constant) Configuration < Acceleration time constant/Deceleration time constant Configuration >

① Acceleration time constant (ms)/Deceleration time constant (ms) configuration:

Acceleration/deceleration (mm/s<sup>2</sup>) must be converted to the acceleration time constant/deceleration time constant (ms). See below for the conversion formula.

Conversion example for a 8[mm] lead actuator driven at an acceleration of 3000 [mm/sec<sup>2</sup>]

#### Rated Motor Rotation Speed (mm/s)

$$\text{Acceleration time constant/deceleration time constant (ms)} = \frac{\{\text{Rated rotation speed (r/min)} \div 60 (S)\} \times \text{screw lead (mm)} \times 1000}{\text{Acceleration/deceleration speed (mm/s}^2\text{)}} \quad \text{*Note)}$$

\*As the acceleration time constant/deceleration time constant units are in ms; this is calculated as (s) ×1000

$$\begin{aligned} \text{Acceleration/Deceleration time constant (ms)} &= \frac{\{3000 (r/min) \div 60 (S)\} \times 8 (mm) \times 1000}{3000 (mm/s^2)} \\ &= 133 (ms) \end{aligned}$$

The acceleration time constant/deceleration time constant defines the time in (ms) when the motor rotations of (3000[r/min]) are met.

The acceleration time constant/deceleration time constant must be a number between 0 and the allowable acceleration/deceleration speed range for each actuator.

No.	Target position -999.999-999.999 mm	Rotation speed 0-65535 r/min	Accel. time const. 0-20000 ms	Decel. time const. 0-20000 ms	Dwell time 0-20000 ms	Auxiliary func. 0-3	M code 0-99
1	0.000	1500	133	133	0	0	0
2	500.000	1500	133	133	0	0	0
3	900.000	1500	133	133	0	0	0
4	0.000	0	0	0	0	0	0
5	0.000	0	0	0	0	0	0
6	0.000	0	0	0	0	0	0
7	0.000	0	0	0	0	0	0
8	0.000	0	0	0	0	0	0
9	0.000	0	0	0	0	0	0
10	0.000	0	0	0	0	0	0
11	0.000	0	0	0	0	0	0
12	0.000	0	0	0	0	0	0
13	0.000	0	0	0	0	0	0
14	0.000	0	0	0	0	0	0

### 5.7.6 Other Settings

The dwell and auxiliary functions are set to 0 as default.

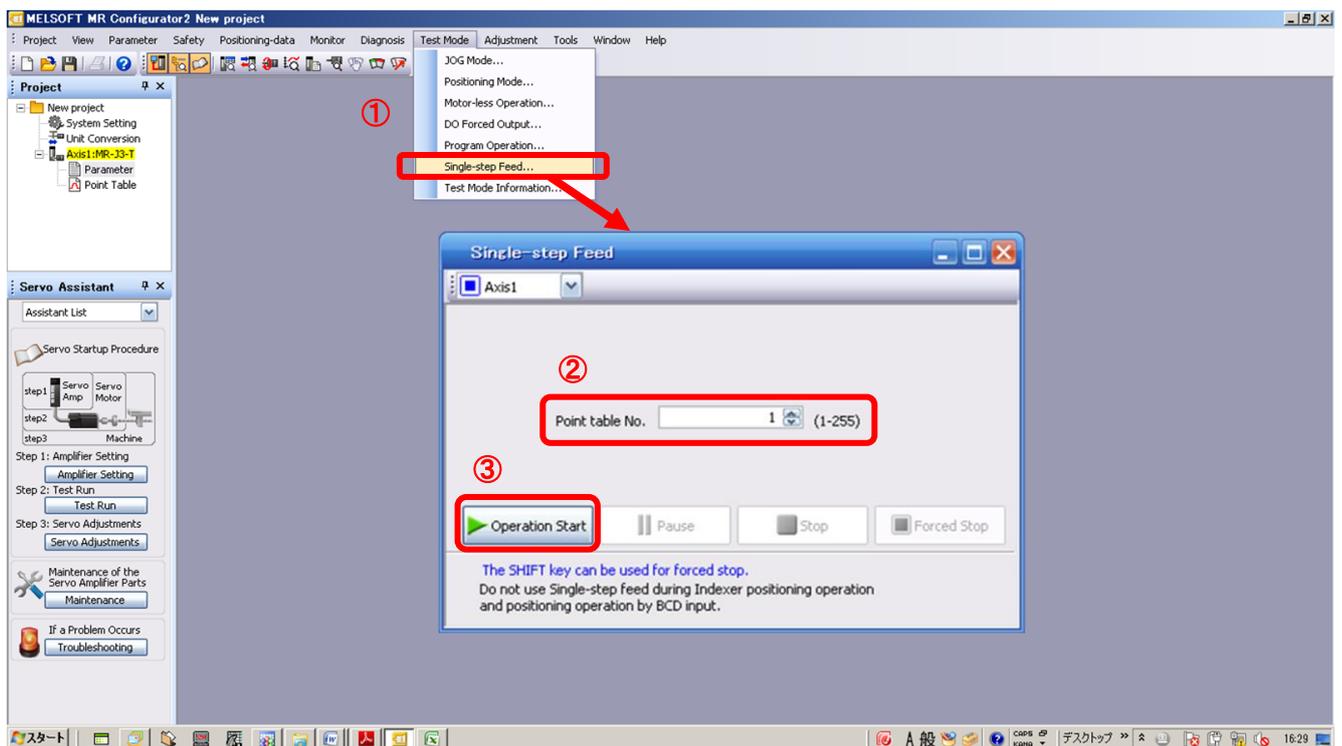
## 5.7.7 Single-Step Feed

In Test mode a single step within point table can be executed.

- ① From the “Test” menu select “Single-step Feed” which opens a window for “Single-step feed”. (When using this function, external input signal operation will be disabled. If controlling using a PLC or other upper level device, ensure the power is turned off and then on before operation.)
- ② Select point table number.
- ③ Press “Start”.

The actuator will set the position at which the power was turned on as the home position (0), and move towards the defined point table position.

\* Check parameters PA06/PA07 parameters (electronic gear duty) if an unexpected move was observed.



### Note

\* Home position return cannot be performed in test mode.

In Test mode the default position of the actuator is set as the home position when the power was turned on. It is therefore possible to drive the actuator past the stroke ends. Please pay particular attention to the position of the actuator on power up.

## 5.8 Saving/Loading Parameters

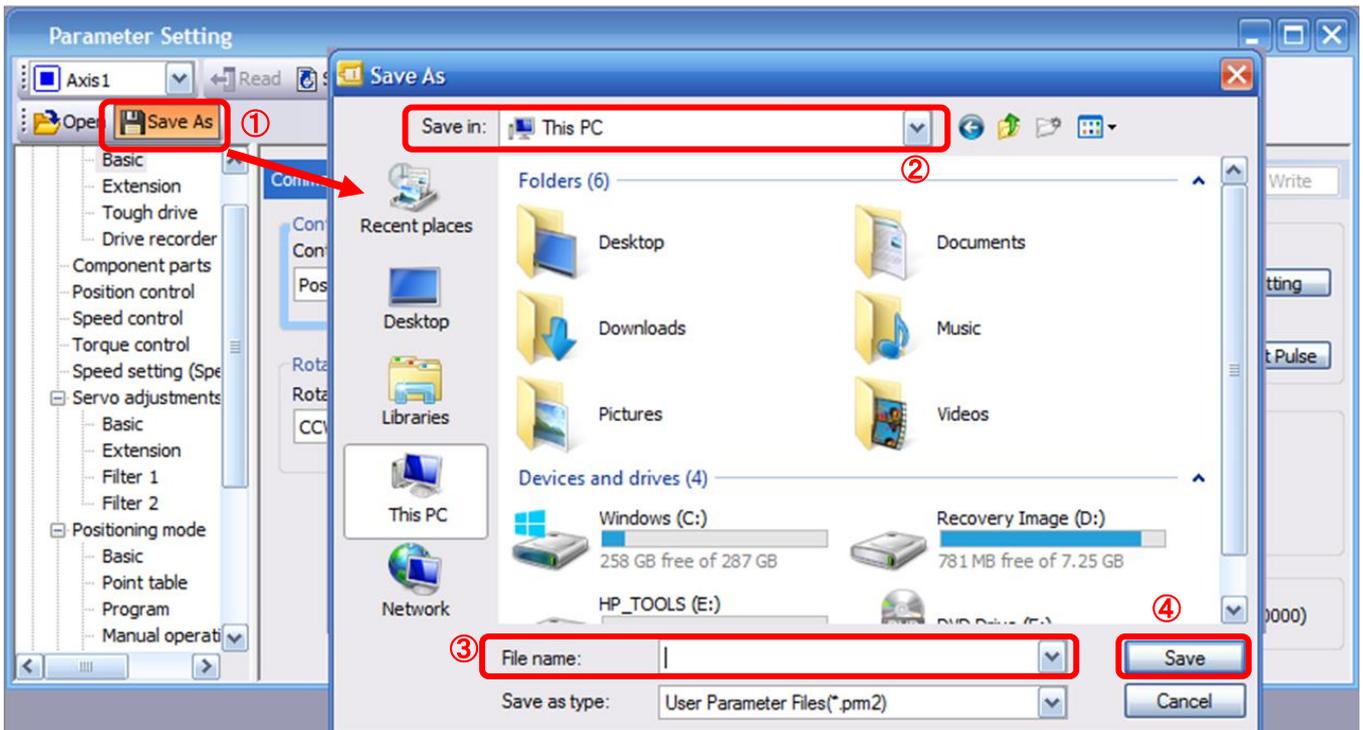
### 5.8.1 Saving Parameters

- ① From the “Parameter Setting” window in the setup software, select “Save As”.
- ② Please specify location to be saved.
- ③ Please enter any file name.
- ④ Click “Save”.

Files Saved

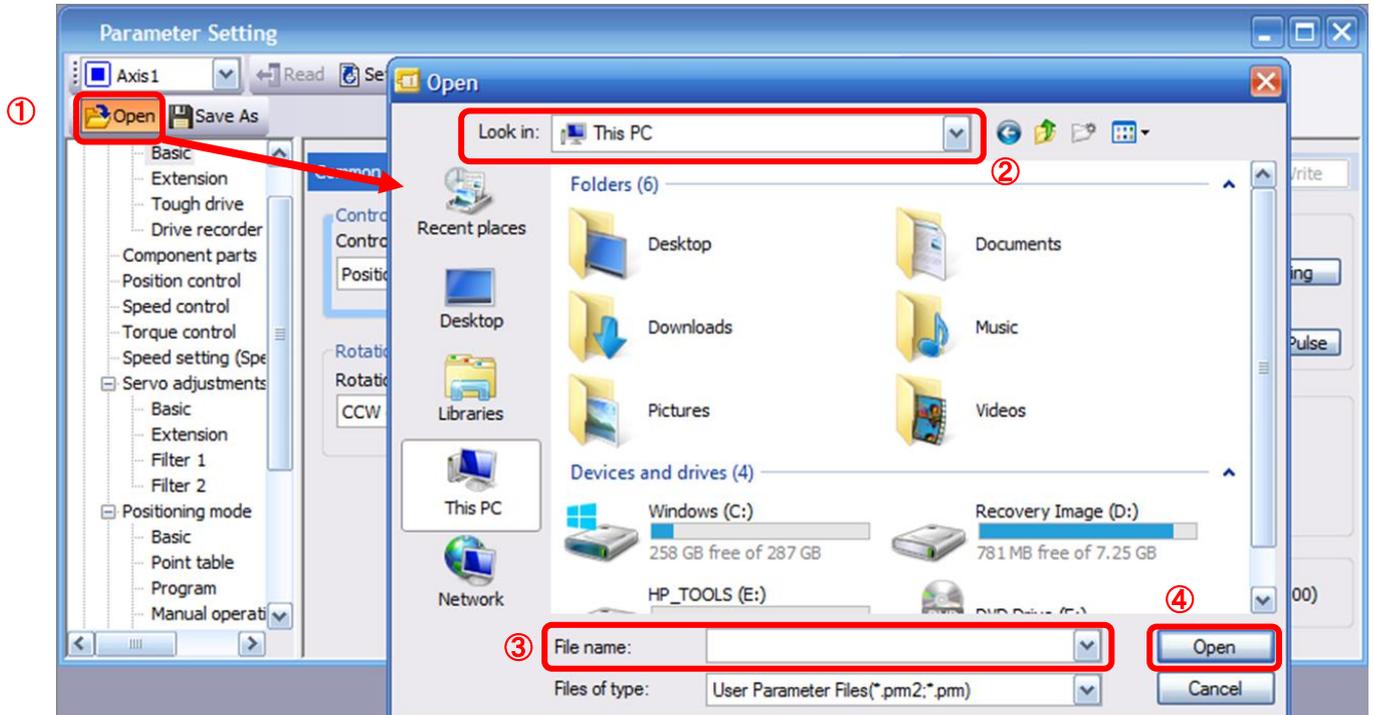
.prm2	Settings files for parameters PA, PB, PC, PD
-------	--

\* Note Always upload current parameters from the driver to the software before saving.  
(See “LESC Operation Manual (Simplified Edition)”, section 5.3.2 for uploading.)



## 5.8.2 To Load saved Parameters

- ① From the “Parameter Setting” window in the setup software, select “Open”.
  - ② Please specify location of the file.
  - ③ Please select the file you wish to import parameters [.prm2].
  - ④ Click “Open”.
- Parameters will be loaded.



## 5.9 Saving/Loading Project

### 5.9.1 Saving Project

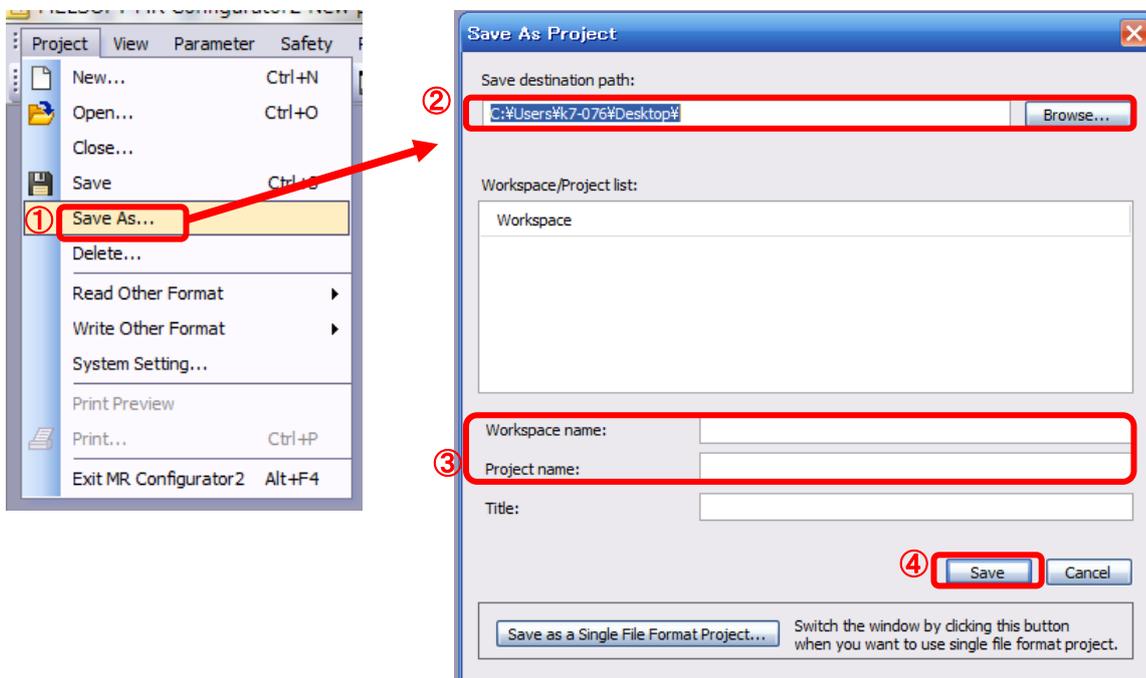
- ① From the “Project” menu in the setup software, select “Save As”.
- ② Please specify location to be saved.
- ③ Please enter any file name.
- ④ Click “Save”.

Project will be saved in the specified folder.

If you change the drive / path name, it will be saved in the "drive ¥path name ¥ project name" folder you have changed.

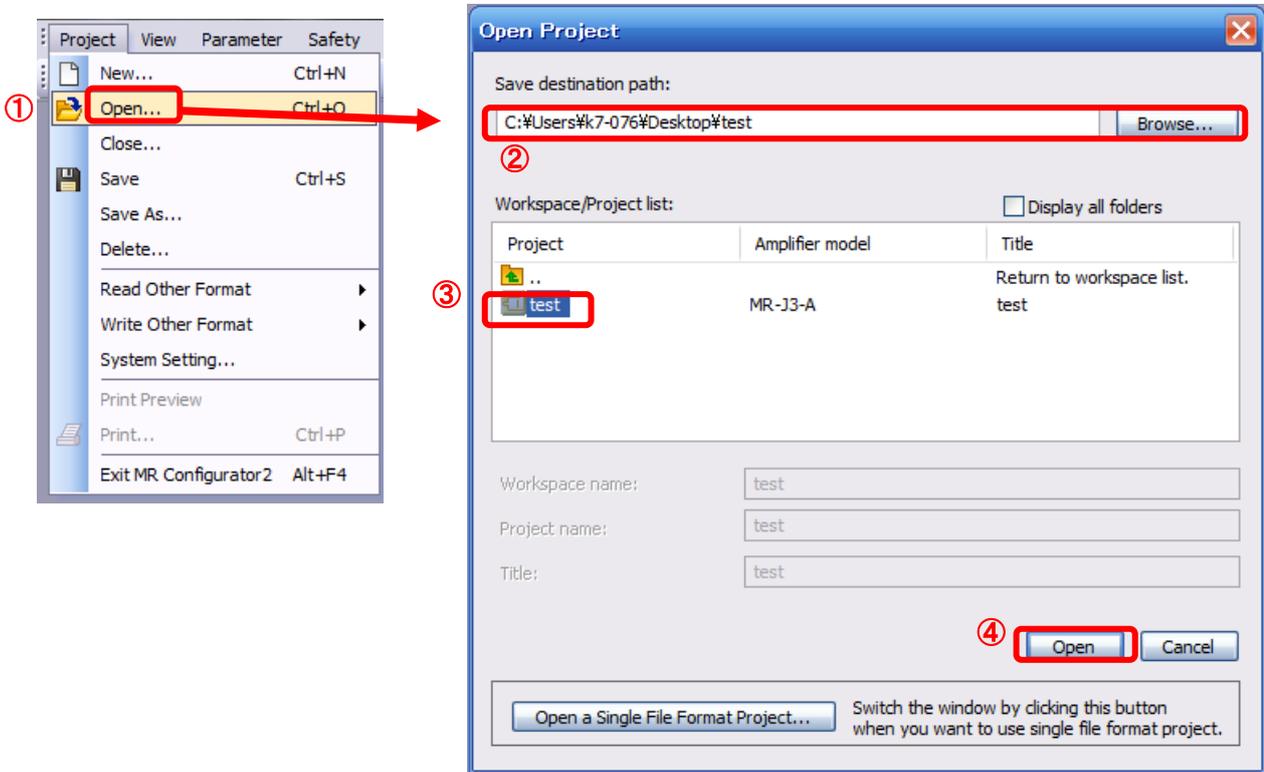
\* Note Always upload current parameters from the driver to the software before saving.

(See “LECSA Operation Manual (Simplified Edition)”, section 5.3.2 for uploading.)



## 5.9.2 To Load saved Project

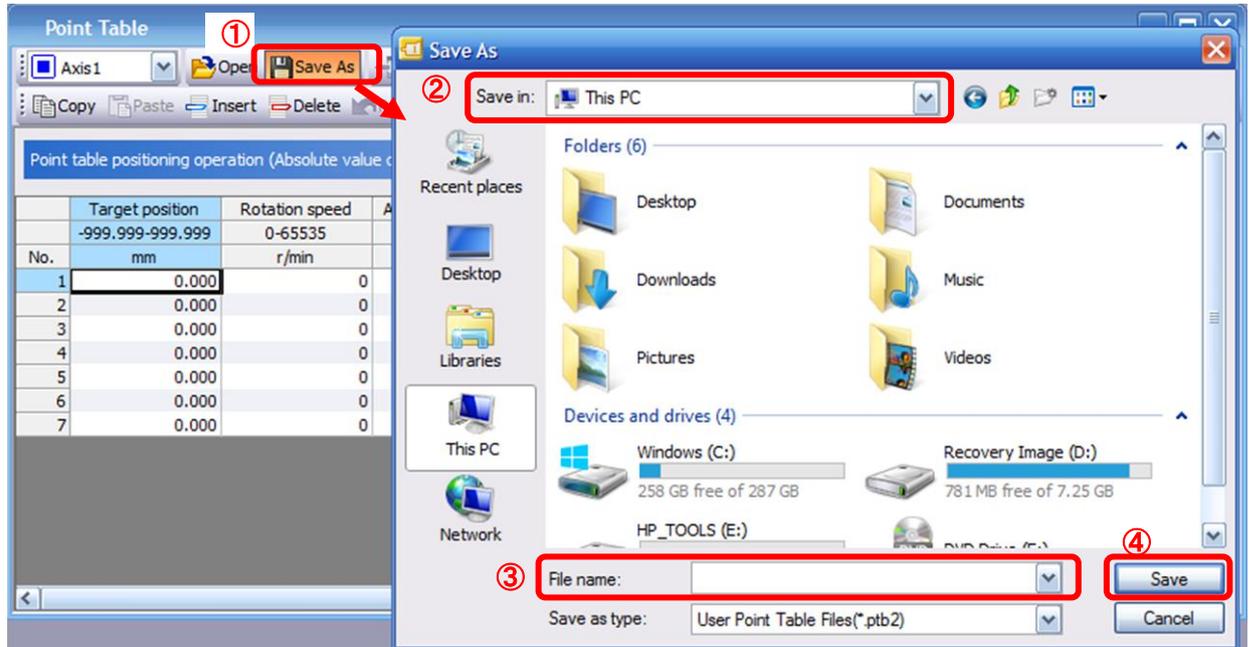
- ① From the “Project” menu in the setup software, select “Open”.
- ② Please select the "drive ¥ path name ¥ project name" that you want to read parameters are stored.
- ③ Please select the file you wish to import project [.mrc2].
- ④ Click “Open”.  
Project will be loaded.



## 5.10 Saving/Loading Point table

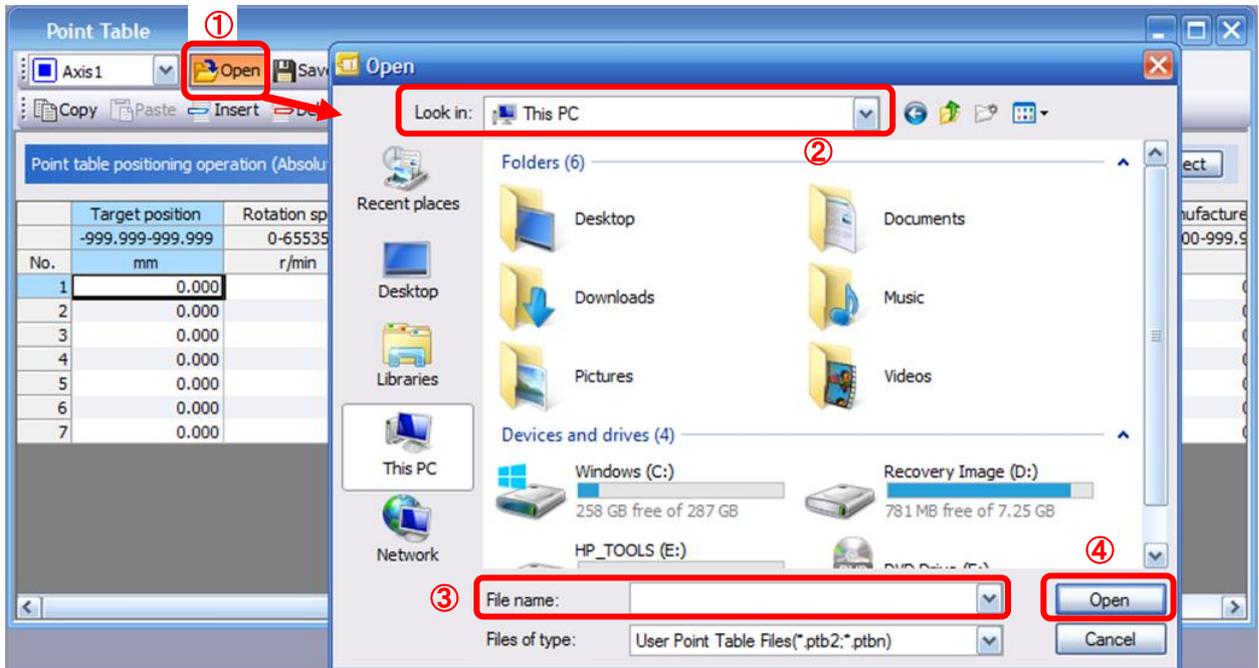
### 5.10.1 Saving Point table

- ① From the “Point Table” window in the setup software, select “Save As”.
- ② Please specify location to be saved.
- ③ Please enter any file name.
- ④ Click “Save”.



## 5.10.2 To Load saved Point table

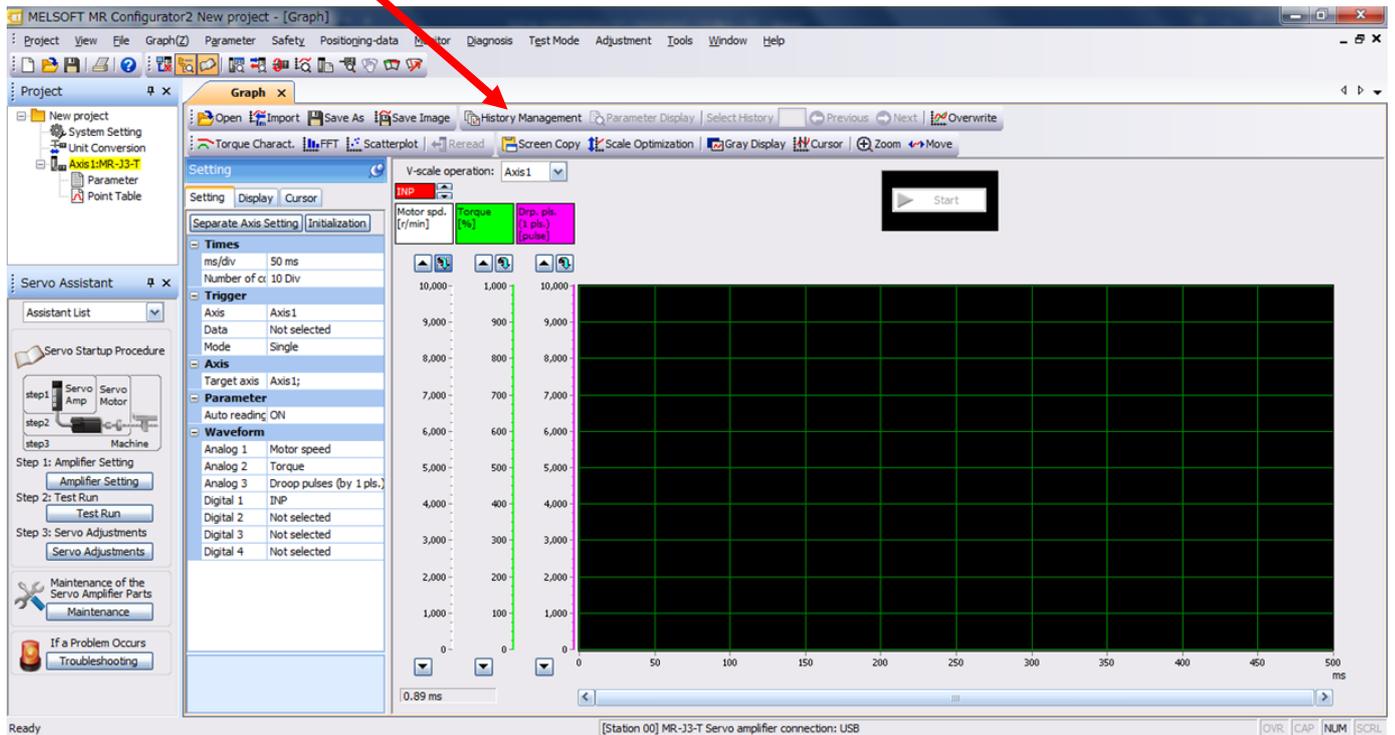
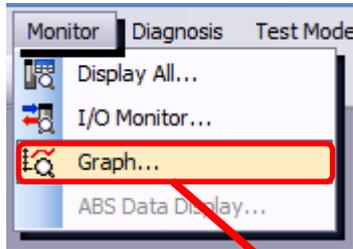
- ① From the “Point table” window in the setup software, select “Open”.
- ② Please specify location of the file.
- ③ Please select the file you wish to import point table [.ptb2].
- ④ Click “Open”.  
Point table will be loaded.



## 5.11 Acquisition of motion waveform with graph monitor

With the setup software (MR Configurator2™: LEC-MRC2E) monitor graph function, the motion waveform during electric actuator operation can be obtained as described below.

- ① Click “Monitor” - “Graph” of Setup software to display “Graph” window.

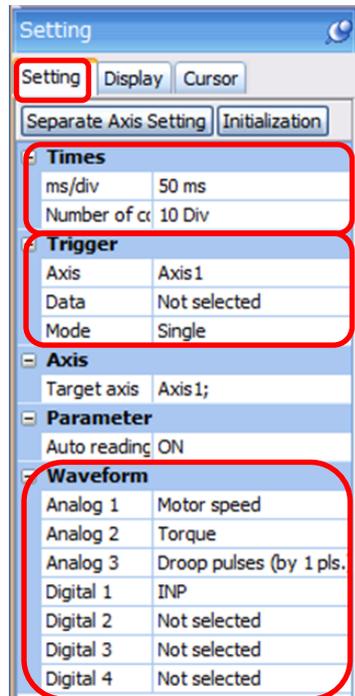


### 5.11.1 Under the setting Tab: Setting of the items to display the graph

Set the items to display analogue and digital waveform, trigger conditions and time for the horizontal axis of the graph.

Click the [Setting] tab of the [Setting] window to set the items to display the waveform, trigger conditions and horizontal axis of the graph.

3 types analogue waveform (analogue 1 to 3) and 4 types of digital waveform (digital 1 to 4) can be set.

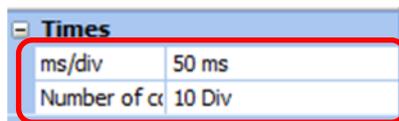


#### (1) Time

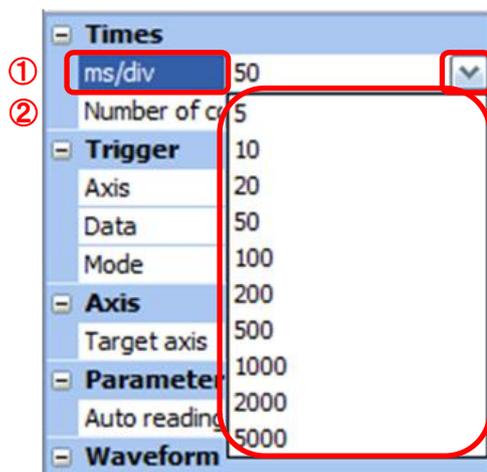
Set the horizontal axis (time axis) of the graph.

For LECSC, set [ms/div] and [Number of collection Div] to the horizontal axis (time axis).

[ms/div] × [Number of collection Div] will be [Measurement time].



- ① Click “” of [ms/div] and set the DiV number.  
The unit ms of [Number of collection Div] is 1000ms=1s.
- ② Click “” of [Number of collection Div] and set the time.



(2) Trigger

“Trigger” is a condition which decides the display timing of the graph. If trigger conditions are not satisfied, waveform will not be displayed.

- ① Click “

(3) “Level” / “Condition” / “Position” are displayed.

- ① Click “

For Motor speed, when the operation direction is positive, “Level” should be 100 and when the operation direction is negative, “Level” should be -100. Align the setting of “Condition” to the operation direction too.

“Level” / “Condition” setting (For Motor speed)

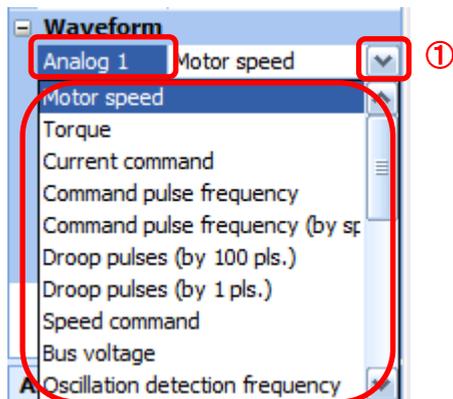
Operating direction	“Level” [r/min]	“Condition”
Positive direction operation	100	Startup
Negative direction operation	-100	Fall

“Position” should be 10%.

(4) Waveform

Set the waveform data which will be displayed in the graph.

- ① Click “” of each “Analog” or “Digital” and set the type of waveform to be displayed.



The analogue and digital waveforms that can be set with LECSC are shown below.

■ Analogue waveform

No.	Name	Function	Unit	Note
1	Motor speed	The motor speed is displayed.	1r/min	
2	Torque	The motor torque is displayed.	0.1%	
3	Current command	The current command to be given to the motor is displayed.	0.1%	
4	Command pulse frequency	The command pulse frequency is displayed.	1.125 kpulse/s	
5	Command pulse frequency (by speed)	The command pulse frequency is converted into the motor speed and displayed.	1r/min	
6	Droop pulse (by 100 pulse)	The droop pulse on the deviation counter is displayed in units of 100pulse. The pulse count is displayed in encoder pulses.	100pulse	
7	Droop pulse (by 1 pulse)	The droop pulse on the deviation counter is displayed in units of 1 pulse. (Note) Any area beyond the display range (-32768 pulses to 32767 pulses) is clamped and displayed in red.	1pulse	
8	Speed command	The speed command to be given to the motor is displayed.	1r/min	
9	Bus voltage	The bus voltage of the driver amplifier is displayed.	1V	
10	Effective load ratio	The continuous effective load torque is displayed. The effective value for the last 15 seconds is displayed.	0.1%	
11	Regenerative load ratio	The ratio of regenerative power to permissible regenerative power is displayed in %.	0.1%	
12	Within one-revolution position	The position is displayed in encoder pulses` to the accuracy of one revolution.	16pulse	
13	ABS counter	The move distance from the home position in the absolute position detection system is displayed in the multiple-revolution counter value of the absolute position encoder.	1rev	
14	Load inertia moment ratio	The estimated ratio of the motor axis converted load inertia moment to the motor inertia moment is displayed.	0.1times	

No.	Name	Function	Unit	Note
15	Torque equivalent to disturbance	The difference between the torque required driving the motor and the actually required torque (torque current value) is displayed in torque equivalent to disturbance.	0.1%	
16	Overload alarm margin	The margin until the load reaches the overload (AL.50, AL.51) alarm level is displayed in %. An overload alarm will occur when margin is 0%.	0.1%	
17	Excessive error alarm margin	The margin until the error reaches the excessive error (AL.52) alarm level is displayed in encoder pulses. An excessive error alarm will occur when margin is zero pulses.	16pulse	
18	Settling time	The settling time for position control is displayed. The method for measuring the settling time can be selected from the separate axis setting.	1ms	
19	Overshoot amount	The overshoot amount for position control is displayed in encoder pulses. The method for measuring the overshoot amount can be selected from the separate axis setting.	1pulse	

■ Digital waveforms

SON, LSP, LSN, TL, TL1, PC, RES, CR, ST1, ST2, EMG, MD0, DOG, OVR, TSTP, TP0, TP1, CDP, TCH, MD1, SIG, SP0...SP2, DI0...DI7, D1, D2, D3 and D4 (Note 1)  
RD, SA, ZSP, TLC, INP, WNG, ALM, OP, MBR, DB, BWNG, CPO, ZP, POT, PUS, CDPS, ABSV, MEND, PT0...PT7

(Note 1) D1, D2, D3 and D4 are for the manufacturer setting.

See "LESC Operation Manual", section 3.5, 4.5 for details of each digital waveform.

## 5.11.2 Trigger wait

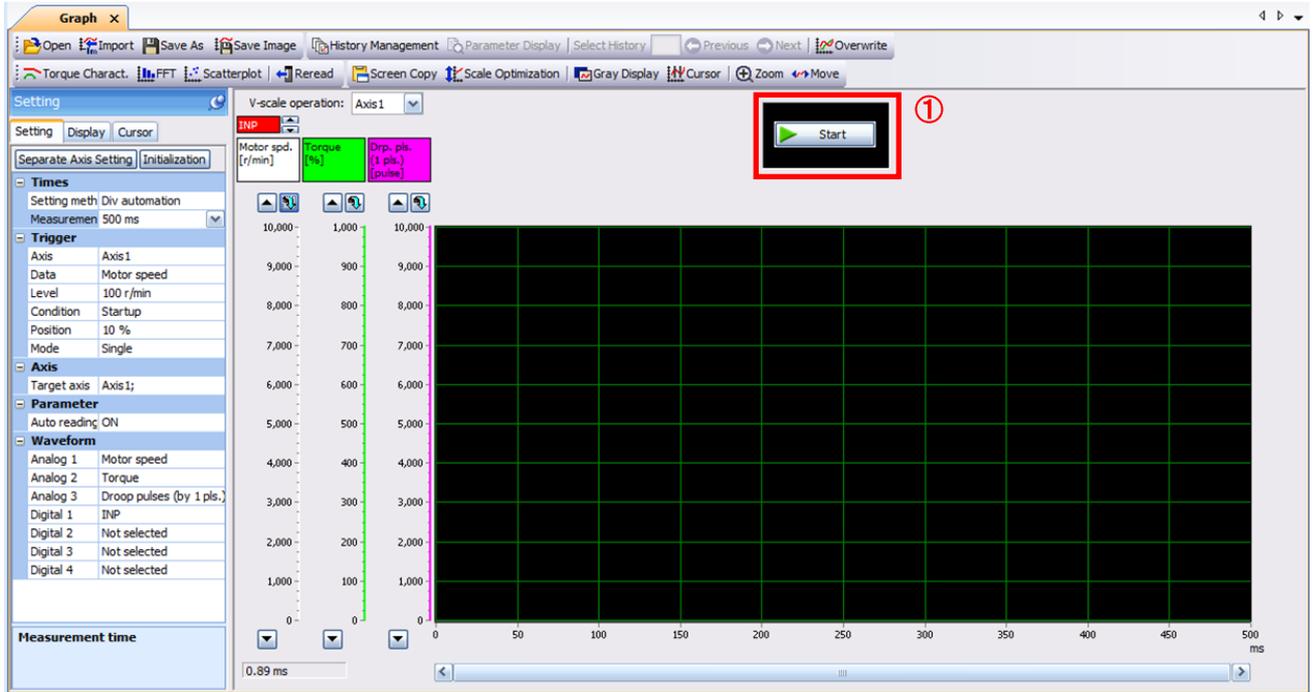
When the “Start” button is clicked, the screen will be on stand-by.

When trigger conditions are satisfied during the trigger wait, waveforms can be captured and displayed.

Click the “Start” button every time measurement fresh capture is required.

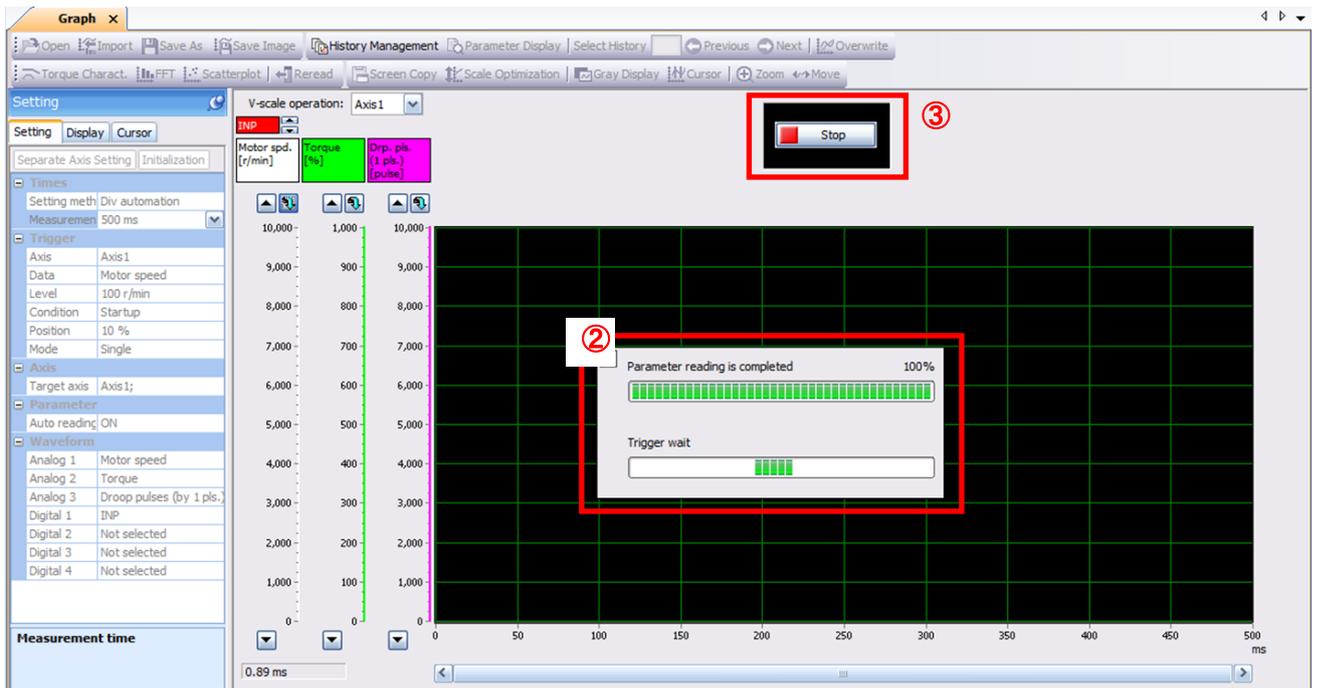
(The advantage of this method of capturing the waveform is a waveform will not be updated in the case of an incorrect operation.)

- ① Click the “Start” button.



- ② Trigger wait is displayed.

- ③ The acquisition of waveform will be canceled with “Stop” button.



### 5.11.3 Operation Instruction

When the PLC on the master side sends the operation command, the actuator will operate.

When the trigger conditions in 5.11.1 (2) are satisfied, the operation waveforms can be captured.

When the time set in 5.11.1 (1) has passed after the acquisition start, the acquisition of the waveforms will complete and waveforms are displayed on the screen.

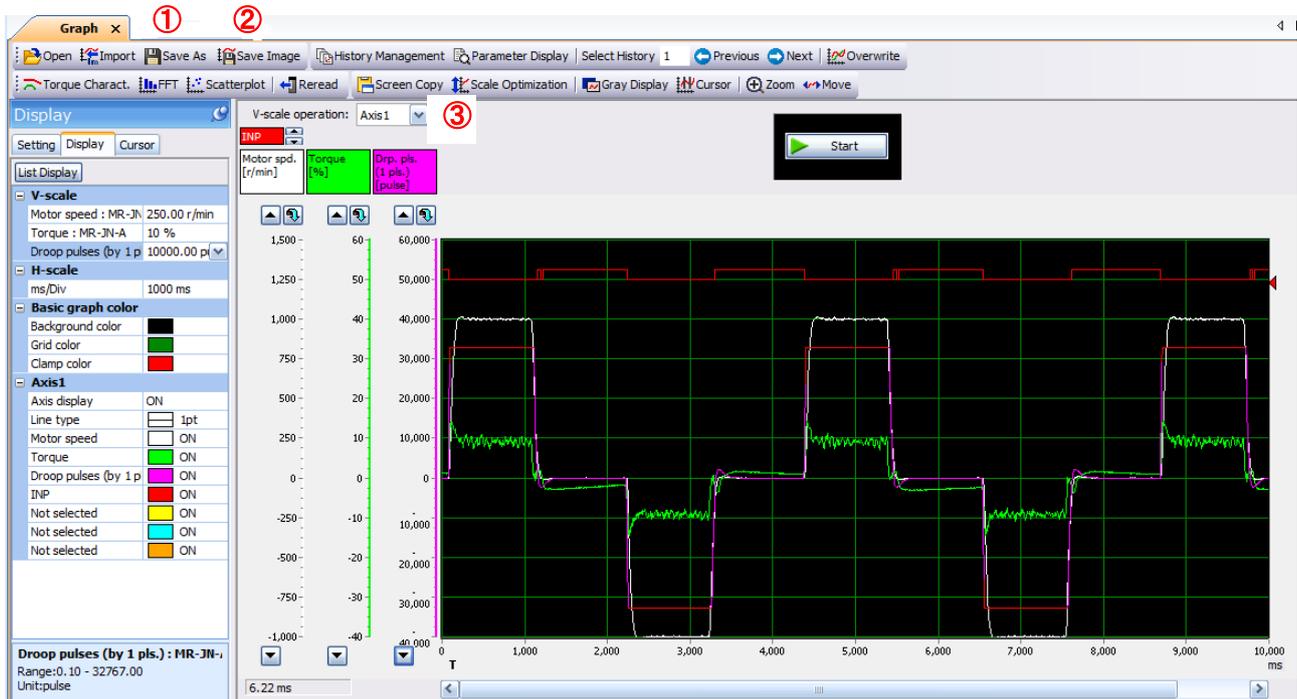
- ① When the “Scale Optimization” button is clicked, the vertical axis range is adjusted automatically.



## 5.11.4 Saving of waveform

After the waveform is displayed, it is possible to save the data in 3 ways.

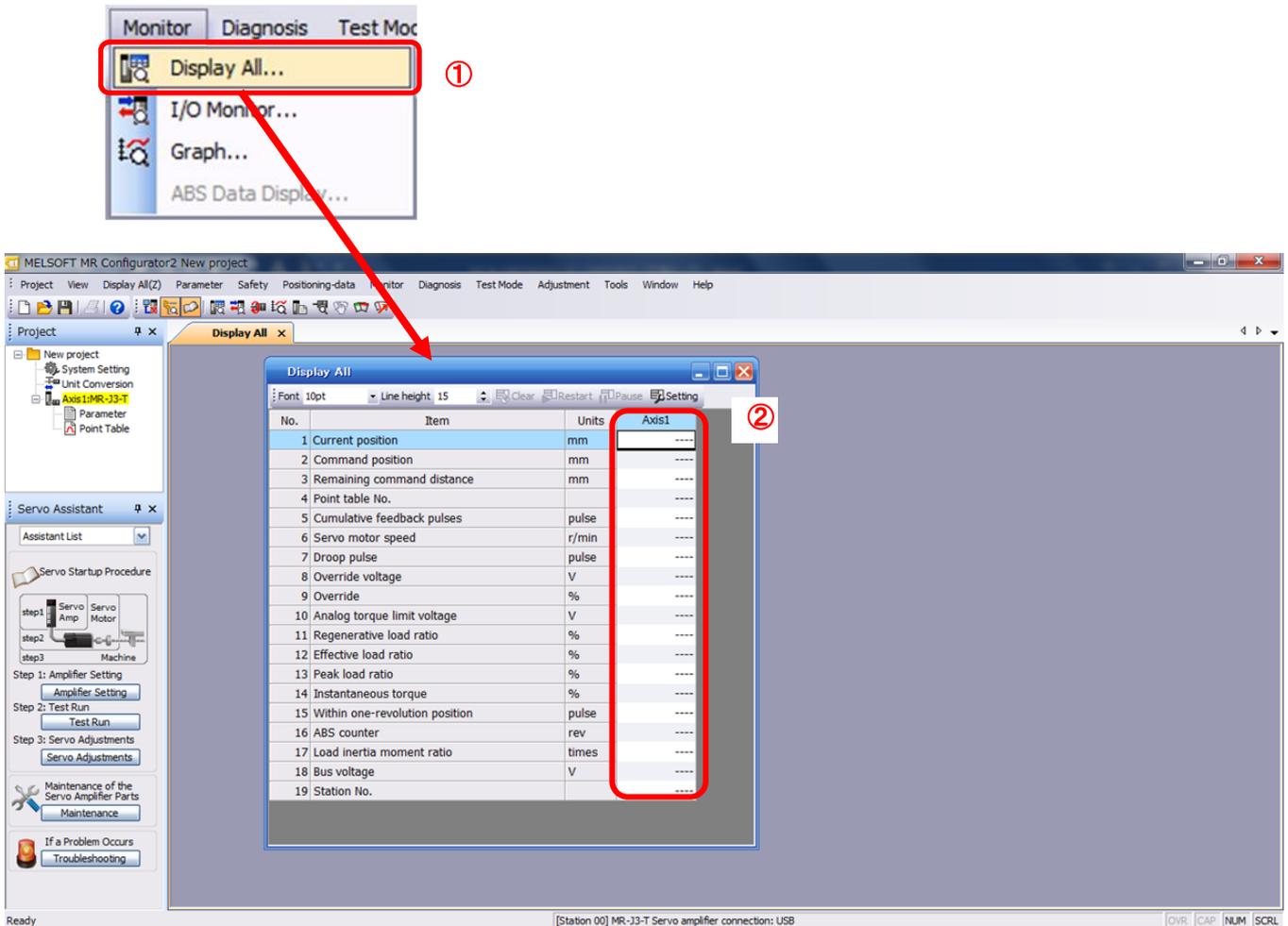
- ① Click the “Save As” button.  
Select the folder in which the step data is to be saved and save the data.  
Waveform data file (extension: gpf2) will be prepared.  
If the waveform condition needs to be checked, it can be displayed on the graph window.
- ② Click the “Save Image” button.  
Select the folder in which the step data is to be saved and save the data.  
An Image file (extension: jpg) will be prepared.
- ③ Click the “Screen Copy” button.  
Save the displayed waveform screen (print screen).



## 5.12 Display All Monitor List

The method how to obtain the electric actuator condition is described with the display all function of the setup software.

- ① Click “Monitor” - “Display All” of the setup software to display “Display All” window.
- ② The condition of each item is displayed.  
For off line of the setup software, [----] will be displayed.



The following items are displayed for LECSC.

No.	Name	Function	Display range	Unit
1	Current position	The actual current position where the machine home position is assumed as zero is displayed.	-9999999 to 9999999 × 10STM	mm
2	Command position	The position data in the point table or the present command position is displayed.	-9999999 to 9999999 × 10STM	mm
3	Command remaining distance	The residual distance up to position command of the currently selected point table is displayed.	-9999999 to 9999999 × 10STM	mm
4	Point table No.	The point table No. being performed is displayed.	0 to 255	-

No.	Name	Function	Display range	Unit
5	Cumulative feedback pulses	Feedback pulses from the motor encoder are counted and displayed. When exceeding 999999999, it returns to zero. Press the [Clear] button to reset the display value to 0 (zero). Reverse rotation is indicated by a minus (-) sign.	-999999999 to 999999999	pulse
6	Motor speed	The motor speed is displayed. The value rounded off is displayed in 0.1r/min.	-7200 to 7200	r/min
7	Droop pulses	The number of droop pulses in the deviation counter is displayed. Reverse rotation is indicated by a minus (-) sign. The number of pulses displayed is in the encoder pulse unit.	-999999999 to 999999999	pulse
8	Override voltage	Input voltage of override voltage is displayed.	-10.00 to 10.0	V
9	Override	The setting value of override is displayed. 100% is displayed when override is invalid.	0 to 200	%
10	Analog torque limit voltage	Analog torque limit voltage is displayed.	0.00 to 10.00	V
11	Regenerative load ratio	The ratio of regenerative power to permissible regenerative power is displayed in %. As the permissible regenerative power depends on whether there is the regenerative brake option or not. Set Parameter PA02 correctly according to the regenerative brake option. The guideline is 80% or less.	0 to 100	%
12	Effective load ratio	The continuous effective load current is displayed. The effective value is displayed relative to the rated current of 100%.	0 to 300	%
13	Peak load ratio	The maximum torque is displayed. The highest value in the past 15 seconds is displayed relative to the rated torque of 100%.	0 to 400	%
14	Instantaneous torque	Torque that occurred instantaneously is displayed. The value of the torque that occurred is displayed in real time relative to the rated torque of 100%.	0 to 400	%
15	Within one-revolution position	Position within one-revolution is displayed in encoder pulses. The value returns to 0 when it exceeds the maximum number of pulses.	0 to 262143	pulse
16	ABS counter	The move distance from the home position (0) in the absolute position detection system is displayed in terms of the absolute position detector's multi-revolution counter value.	-32768 to 32767	rev
17	Load inertia moment ratio	The estimated ratio of the motor axis converted inertia moment to the motor inertia moment is displayed.	0.0 to 300.0	times
18	Bus voltage	The voltage (across (P) - (N) and (P+) - (N-)) of the main circuit converter is displayed.	0 to 900	V
19	Station No.	The voltage (across P-N or P+-N-) of the main circuit converter is displayed.	0 to 900	V

## 6. CC-Link setting

CC-Link function of the driver. Wiring and PLC setting must to satisfy the specifications.

CC-Link communication functions

Communication specifications

Item		Specifications				
Power supply		5VDC supplied from driver				
CC-Link	Applicable CC-Link version	Ver.1.10				
	Communication speed	10M/5M/2.5M/625k/156kbps				
	Communication system	Broadcast polling system				
	Synchronization system	Frame synchronization system				
	Encoding system	MRZI				
	Transmission path format	Bus format (conforming to EIA RS485)				
	Error control system	CRC ( $X^{16}+X^{12}+X^5+1$ )				
	Connection cable	CC-Link Ver.1.10-compliant cable (Shielded 3-core twisted pair cable)				
	Transmission format	Conforming to HDLC				
	Remote station number	1 to 64				
	(Note)	Communication speed	156Kbps	625Kbps	2.5Mbps	5Mbps
Cable length	Maximum overall cable length	1200m	900m	400m	160m	100m
	Inter-station cable length	0.2m or more				
Number of drivers connected		Max. 42 (when 1 station is occupied by 1 driver), (max. 32 when 2 stations are occupied by 1 driver), when there are only remote device stations. Can be used with other equipment.				

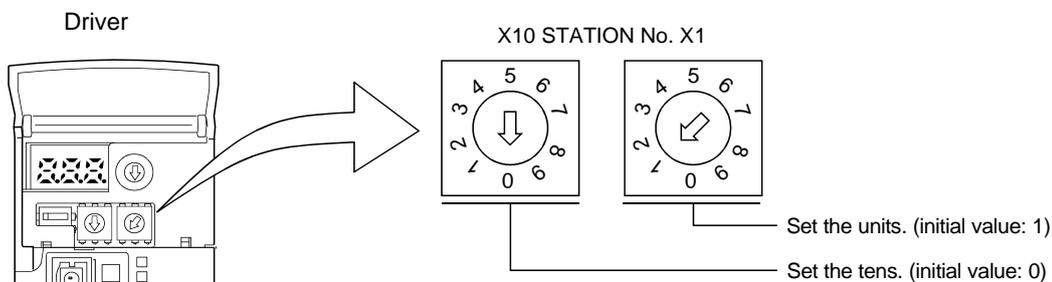
Note. If the system comprises of both CC-Link Ver.1.00- and Ver.1.10-compliant cables, Ver.1.00 specifications are applied to the overall cable length and the cable length between stations.

## 6.1 Station number setting

Set the station number of each driver.

### Station number setting method

Set the station number with the station number switches (STATION NO.) on the driver front. The station number that may be set is any of 1 to 64 in decimal. In the initial status, the station number is set to station 1.



#### POINT

- Be sure to set the station numbers within the range of 1 to 64. Do not set any other values, as they will not be valid.

### How to number the stations

Set the servo station numbers before powering on the drivers. Note the following points when setting the station numbers.

- Station numbers may be set within the range 1 to 64.
- One driver occupies 1 or 2 stations. (One station of programmable driver remote device station)
- Max. number of connected units: 42

Note that the following conditions must be satisfied.

$$\{(1 \times a) + (2 \times b) + (3 \times c) + (4 \times d)\} \leq 64$$

a: Number of 1-station occupying units

b: Number of 2-station occupying units

c: Number of 3-station occupying units (not available for LECSC□-□)

d: Number of 4-station occupying units (not available for LECSC□-□)

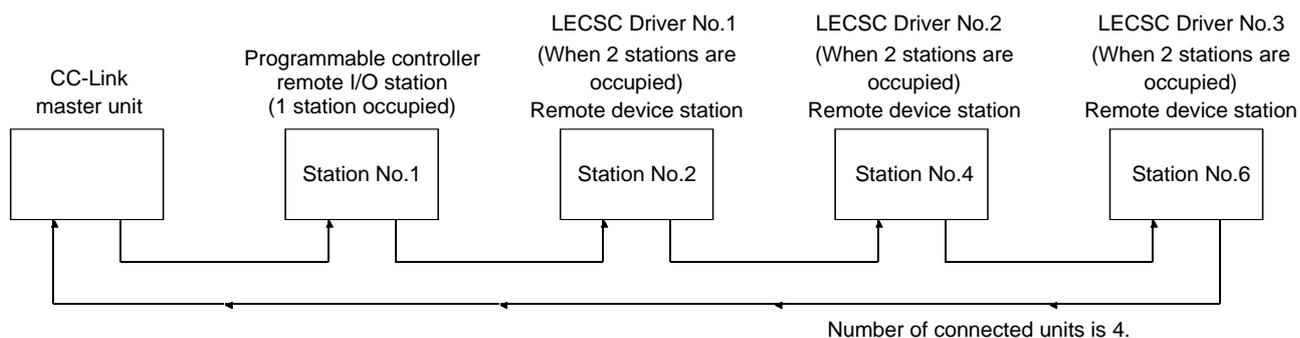
$$\{(16 \times A) + (54 \times B) + (88 \times C)\} \leq 2304$$

A: Number of remote I/O stations  $\leq 64$

B: Number of remote device stations  $\leq 42$

C: Number of local stations  $\leq 26$

- When the number of units connected is 4, station numbers can be set as shown below.



## 6.2 Communication baud rate setting

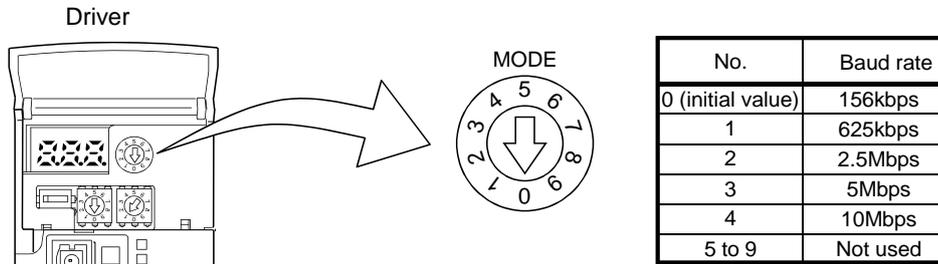
Setting of communication baud rate.

\* Set based on the transfer baud rate of PLC.

Communication baud rate setting

Set the transfer baud rate of CC-Link with the transfer baud rate switch (MODE) on the driver front. The initial value is set to 156kbps.

The overall distance of the system changes with the transfer speed setting.

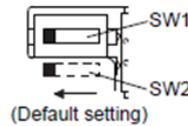
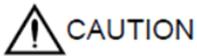


## 6.3 Occupied station count setting

Select the number of occupied station.

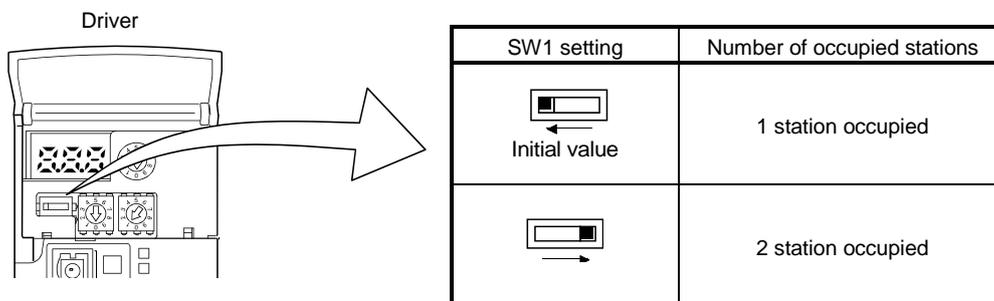
\* Applicable input/output device depends on the number of station. When the point table occupies 1 station, a maximum of 31 points are usable. 255 points become usable when 2 stations are occupied. Remote register based positioning is applicable only when 2 stations are occupied. Refer to "LESC Operation Manual (Simplified Edition)", section 6.4 for details on usable devices.

- \* Do not change the default setting (left) of the manufacturer setting switch (SW2).
  - \* For "A8D:CC-Link alarm".
- Please confirm the manufacturer setting switch (SW2).



Occupied station count setting

Set the number of occupied stations with the occupied station count switch (SW1) on the driver front. The usable I/O device and the number of connectable units change with the set number of occupied stations. Refer to "LESC Operation Manual", section 3.2.3. The default setting is "1 station occupied".



## 6.4 Parameter setting by PLC

Setting of CC-Link parameter by PLC.

EX.) When Mitsubishi Electric Corporation) GX works2™, master unit QJ61BT11N is used.

When refresh device, X1000, Y1000, W0, or W100, occupies 2 stations.

If other equipment is used, refer to the operation manual of the equipment.

Number of Modules		1	Boards	Blank : No Setting	Set
Start (I/O No.)		0000			
Operation Setting		Operation Setting			
Type		Master Station			
Master Station Data Link Type		PLC Parameter Auto Start			
Mode		Remote Net(Ver.1 Mode)			
Total Module Connected(*1)		0			
Remote Input(RX)		X1000			
Remote Output(RY)		Y1000			
Remote Register(RWr)		W0			
Remote Register(RWw)		W100			
Ver.2 Remote Input(RX)					
Ver.2 Remote Output(RY)					
Ver.2 Remote Register(RWr)					
Ver.2 Remote Register(RWw)					
Special Relay(SB)		S00			
Special Register(SW)		SW0			
Retry Count		3			
Automatic Reconnection Station Count		1			
Standby Master Station No. (*1)					
PLC Down Select		Stop			
Scan Mode Setting		Asynchronous			
Delay Time Setting		0			
Station Information Setting		CC-Link Configuration Setting			
Remote Device Station Initial Setting		Initial Setting			
Interrupt Settings		Interrupt Settings			

## 6.5 Device

The input signals (input devices) may be used as either the CC-Link or CN6 external input signals. Make selection in parameter No.PD06 to PD11, PD12 and PD14. The output signals (output devices) can be used as both the CC-Link • CN6 external output signals.

POINT
<ul style="list-style-type: none"> <li>In the factory-shipped status, the forward rotation stroke end (LSP), reverse rotation stroke end (LSN) and proximity dog (DOG) are valid as the CN6 external input signals.</li> </ul>

List of device. Refer to "LECSC Operation Manual (Simplified Edition)", section 6.5.1. for details.

(1) When 1 station is occupied

RYn/RXn: 32 points each, RWrn/RWwn: 4 points each

Programmable PC or PLC...etc → LECSC Driver (RYn)			
(Note) Device No.	Signal name	Signal abbreviation	CN6 connector pin No.
RYn0	Servo-on	SON	
RYn1	Forward rotation start	ST1	
RYn2	Reverse rotation start	ST2	
RYn3	Proximity dog	DOG	2
RYn4	Forward rotation stroke end	LSP	3
RYn5	Reverse rotation stroke end	LSN	4
RYn6	Automatic/manual selection	MDO	
RYn7	Temporary stop/Restart	TSTP	
RYn8	Monitor output execution demand	MOR	
RYn9	Instruction code execution demand	COR	
RYnA	Point table No. selection 1	DI0	
RYnB	Point table No. selection 2	DI1	
RYnC	Point table No. selection 3	DI2	
RYnD	Point table No. selection 4	DI3	
RYnE	Point table No. selection 5	DI4	
RYnF	Clear	CR	
RY(n+1)0 to RY(n+1)9	Reserved		
RY(n+1)A	Reset	RES	
RY(n+1)B to RY(n+1)F	Reserved		

LECSC Driver → Programmable PC or PLC...etc (RXn)			
(Note) Device No.	Signal name	Signal abbreviation	CN6 connector pin No.
RXn0	Ready	RD	14
RXn1	In position	INP	
RXn2	Rough match	CPO	
RXn3	Home position return completion	ZP	16
RXn4	Limiting torque	TLC	
RXn5	Reserved		
RXn6	Electromagnetic brake interlock	MBR	
RXn7	Temporary stop	PUS	
RXn8	Monitoring	MOF	
RXn9	Instruction code execution completion	COF	
RXnA	Warning	WNG	
RXnB	Battery warning	BWNG	
RXnC	Movement completion	MEND	
RXnD	Dynamic brake interlock	DB	
RXnE	Position range output	POT	
RXnF	Reserved		
RX(n+1)1 to RX(n+1)9	Reserved		
RX(n+1)A	Problem	ALM	15
RX(n+1)B	Remote station communication ready	CRD	
RX(n+1)C to RX(n+1)F	Reserved		

Programmable PC or PLC...etc → LECSC Driver (RWwn)	
Address No.	Signal name
RWwn	Monitor 1
RWwn+1	Monitor 2
RWwn+2	Instruction code
RWwn+3	Writing data

LECSC Driver → Programmable PC or PLC...etc (RWrn)	
Address No.	Signal name
RWrn	Monitor 1 data
RWrn+1	Monitor 2 data
RWrn+2	Respond code
RWrn+3	Reading data

Note. "n" depends on the station number setting.

(2) When 2 stations are occupied

RXn/RYn: 64 points each, RWrn/RWwn: 8 points each

Programmable PC or PLC...etc → LECSC Driver (RYn)			
(Note) Device No.	Signal name	Signal abbreviation	CN6 connector pin No.
RYn0	Servo-on	SON	
RYn1	Forward rotation start	ST1	
RYn2	Reverse rotation start	ST2	
RYn3	Proximity dog	DOG	2
RYn4	Forward rotation stroke end	LSP	3
RYn5	Reverse rotation stroke end	LSN	4
RYn6	Automatic/manual selection	MDO	
RYn7	Temporary stop/Restart	TSTP	
RYn8	Monitor output execution demand	MOR	
RYn9	Instruction code execution demand	COR	
RYnA	Point table No. selection 1	DI0	
RYnB	Point table No. selection 2	DI1	
RYnC	Point table No. selection 3	DI2	
RYnD	Point table No. selection 4	DI3	
RYnE	Point table No. selection 5	DI4	
RYnF	Clear	CR	
RY(n+1)0 to RY(n+1)F	Reserved		
RY(n+2)0	Position instruction execution demand (Note)		
RY(n+2)1	Speed instruction execution demand (Note)		
RY(n+2)2	Reserved		
RY(n+2)3	Point table No. selection 6	DI5	
RY(n+2)4	Point table No. selection 7	DI6	
RY(n+2)5	Point table No. selection 8	DI7	
RY(n+2)6	Internal torque limit selection	TL1	
RY(n+2)7	Proportion control	PC	
RY(n+2)8	Gain changing	CDP	
RY(n+2)9	Reserved		
RY(n+2)A	Position/speed specifying system selection		
RY(n+2)B	Absolute value/incremental value selection		
RY(n+2)C to RY(n+2)F	Reserved		
RY(n+3)0 to RY(n+3)9	Reserved		
RY(n+3)A	Reset	RES	

LECSC Driver → Programmable PC or PLC...etc (RXn)			
(Note) Device No.	Signal name	Signal abbreviation	CN6 connector pin No.
RXn0	Ready	RD	14
RXn1	In position	INP	
RXn2	Rough match	CPO	
RXn3	Home position return completion	ZP	16
RXn4	Limiting torque	TLC	
RXn5	Reserved		
RXn6	Electromagnetic brake interlock	MBR	
RXn7	Temporary stop	PUS	
RXn8	Monitoring	MOF	
RXn9	Instruction code execution completion	COF	
RXnA	Warning	WNG	
RXnB	Battery warning	BWNG	
RXnC	Movement completion	MEND	
RXnD	Dynamic brake interlock	DB	
RXnE	Position range output	POT	
RXnF to RX(n+1)F	Reserved		
RX(n+2)0	Position instruction execution completion		
RX(n+2)1	Speed instruction execution completion		
RX(n+2)2	Point table No. output 1	PT0	
RX(n+2)3	Point table No. output 2	PT1	
RX(n+2)4	Point table No. output 3	PT2	
RX(n+2)5	Point table No. output 4	PT3	
RX(n+2)6	Point table No. output 5	PT4	
RX(n+2)7	Point table No. output 6	PT5	
RX(n+2)8	Point table No. output 7	PT6	
RX(n+2)9	Point table No. output 8	PT7	
RX(n+2)A to RX(n+2)F	Reserved		
RX(n+3)0 to RX(n+3)9	Reserved		
RX(n+3)A	Problem	ALM	15
RX(n+3)B	Remote station communication ready	CRD	
RX(n+3)C to RX(n+3)F	Reserved		

Note. "n" depends on the station number setting.

Programmable PC or PLC...etc → LECSC Driver (RWwn)	
(Note 1) Address No.	Signal name
RWwn	(Note 2) Monitor 1
RWwn+1	(Note 2) Monitor 2
RWwn+2	Instruction code
RWwn+3	Writing data
RWwn+4	(Note 3) Position command data lower 16 bit/Point table No.
RWwn+5	Position command data upper 16 bit
RWwn+6	(Note 4) Speed command data/Point table No.
RWwn+7	Reserved

LECSC Driver → Programmable PC or PLC...etc (RWrn)	
(Note 1) Address No.	Signal name
RWrn	Monitor 1 data lower 16 bit
RWwn+1	Monitor 1 data upper 16 bit
RWwn+2	Respond code
RWwn+3	Reading data
RWwn+4	
RWwn+5	Monitor 2 data lower 16 bit
RWwn+6	Monitor 2 data upper 16 bit
RWwn+7	Reserved

Note 1. "n" depends on the station number setting.

2. Specify the code of the lower 16 bit as the monitor code of 32-bit data.
3. When the parameter No.PC30 setting is "□□□0", specify the point table No. in RWwn+4. When the parameter No.PC30 setting is "□□□1" or "□□□2", specify the position data in RWwn+4/RWwn+5 and turn ON Position instruction execution demand (RY(n+2)0).
4. When the parameter No.PC30 setting is "□□□1", specify the point table No. in RWwn+6. When the parameter No.PC30 setting is "□□□2", specify the speed data in RWwn+6, and turn ON Speed instruction execution demand (RY(n+2)1). When setting the parameter No.PC30 to "□□□2", always set the acceleration/deceleration time constant in the point table No.1. When the parameter No.PC30 setting is "□□□0", the RWwn+6 value is not used.

## 6.5.1 Detailed explanation of Input signals (Input devices)

The note signs in the remarks column indicates the following descriptions.

\*1: Can be used as external input signals of CN6 connector by setting parameters No.PD06 to PD08 and parameter No.PD12 PD14.

\*2: Can be automatic turned ON internally by setting parameters No.PD01 PD04.

The device whose Device No. field has an oblique line cannot be used in CC-Link.

Signal name (Device name)	Description	Device No.		Remarks
		1 station occupied	2 stations occupied	
Servo-on (SON)	Turning RYn0 (SON) ON powers on the base circuit, making operation ready to start. (Servo on status) Turning it OFF powers off the base circuit, coasting the servo motor. (Servo off status)	RYn0	RYn0	* 1
Forward rotation start (ST1)	1. In absolute value command system Turning RYn1 (ST1) ON for automatic operation executes positioning once on the basis of the position data set to the point table. Turning RYn1 (ST1) ON for a home position return immediately starts a home position return. Keeping RYn1 (ST1) ON for JOG operation performs rotation in the forward rotation direction. Forward rotation indicates the address increasing direction. 2. In incremental value command system Turning RYn1 (ST1) ON for automatic operation executes positioning once in the forward rotation direction on the basis of the position data set to the point table. Turning RYn1 (ST1) ON for a home position return immediately starts a home position return. Keeping RYn1 (ST1) ON for JOG operation performs rotation in the forward rotation direction. Forward rotation indicates the address increasing direction.	RYn1	RYn1	* 1
Reverse rotation start (ST2)	Use this device in the incremental value command system. Turning RYn2 (ST2) ON for automatic operation executes positioning once in the reverse rotation direction on the basis of the position data set to the point table. Keeping RYn2 (ST2) ON for JOG operation performs rotation in the reverse rotation direction. Reverse rotation indicates the address decreasing direction. Reverse rotation start (RYn2) (ST2) is also used as the start signal of the high-speed automatic positioning function to the home position.	RYn2	RYn2	* 1

Signal name (Device name)	Description	Device No.		Remarks																										
		1 station occupied	2 stations occupied																											
Proximity dog (DOG)	<p>In the shipment status, the proximity dog external input signal (CN6-2) is valid. For use in CC-Link, make it usable in parameter No.PD14. When RYn3 (DOG) is turned OFF, the proximity dog is detected. The polarity of dog detection can be changed using parameter No.PD16.</p> <table border="1"> <thead> <tr> <th>Parameter No.PD16</th> <th>Proximity dog (RYn3) detection polarity</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/>0<input type="checkbox"/><input type="checkbox"/> (initial value)</td> <td>OFF</td> </tr> <tr> <td><input type="checkbox"/>1<input type="checkbox"/><input type="checkbox"/></td> <td>ON</td> </tr> </tbody> </table>	Parameter No.PD16	Proximity dog (RYn3) detection polarity	<input type="checkbox"/> 0 <input type="checkbox"/> <input type="checkbox"/> (initial value)	OFF	<input type="checkbox"/> 1 <input type="checkbox"/> <input type="checkbox"/>	ON	RYn3	RYn3	* 1																				
Parameter No.PD16	Proximity dog (RYn3) detection polarity																													
<input type="checkbox"/> 0 <input type="checkbox"/> <input type="checkbox"/> (initial value)	OFF																													
<input type="checkbox"/> 1 <input type="checkbox"/> <input type="checkbox"/>	ON																													
Forward rotation stroke end (LSP)	<p>In the factory-shipped status, the forward rotation stroke end is valid as the external input signal (CN6-3) and the reverse rotation stroke end is valid as the external input signal (CN6-4). Before operation, short between CN6-3 and DOCOM, and between CN6-4 and DOCOM. Opening them causes a sudden stop, resulting in servo lock.</p> <p>For use in CC-Link, make it usable in parameter No.PD12. When starting operation, turn RYn4 (LSP) /RYn5 (LSN) to ON. Turning it to OFF causes a sudden stop, resulting in servo lock. A stopping method can be changed in parameter No.PD20. When not using the forward/reverse rotation stroke end, set "Automatic ON" in parameter No.PD01.</p> <table border="1"> <thead> <tr> <th colspan="2">(Note) Input signal</th> <th colspan="2">Operation</th> </tr> <tr> <th>RYn4</th> <th>RYn5</th> <th>CCW direction</th> <th>CW direction</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>○</td> <td>○</td> </tr> <tr> <td>0</td> <td>1</td> <td colspan="2" rowspan="2" style="text-align: center;">/</td> </tr> <tr> <td>1</td> <td>0</td> <td>○</td> </tr> <tr> <td>0</td> <td>0</td> <td colspan="2" rowspan="2" style="text-align: center;">/</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Note. 0: OFF 1: ON</p>	(Note) Input signal		Operation		RYn4	RYn5	CCW direction	CW direction	1	1	○	○	0	1	/		1	0	○	0	0	/					RYn4	RYn4	* 1 * 2
(Note) Input signal		Operation																												
RYn4	RYn5	CCW direction	CW direction																											
1	1	○	○																											
0	1	/																												
1	0			○																										
0	0	/																												
Reverse rotation stroke end (LSN)		RYn5	RYn5																											
Automatic/manual selection (MD0)	Turning RYn6 (MD0) ON selects the automatic operation mode, and turning it OFF selects the manual operation mode.	RYn6	RYn6	* 1																										
Temporary stop/Restart (TSTP)	<p>Turning RYn7 (TSTP) ON during automatic operation makes a temporary stop.</p> <p>Turning RYn7 ON again makes a restart.</p> <p>Forward rotation start (RYn1) (ST1) or Reverse rotation start (RYn2) (ST2) is ignored if it is turned ON during a temporary stop.</p> <p>When the automatic operation mode is changed to the manual operation mode during a temporary stop, the movement remaining distance is erased.</p> <p>During a home position return or during JOG operation, Temporary stop/Restart input is ignored.</p>	RYn7	RYn7																											

Signal name (Device name)	Description	Device No.		Remarks																																																																																																											
		1 station occupied	2 stations occupied																																																																																																												
Monitor output execution demand (MOR)	<p>When RYn8 (MOR) is turned ON, the following data and signals are set. At the same time, RXn8 turns ON. While RYn8 (MOR) is ON, the monitor values are kept updated.</p> <p>1) When 1 station is occupied</p> <p>Remote register RWrn: Data demanded by Monitor 1 (RWwn)</p> <p>Remote register RWrn + 1: Data demanded by Monitor 2 (RWwn+1)</p> <p>Remote register RWrn + 2: Respond code indicating normal or error</p> <p>2) When 2 stations are occupied</p> <p>Remote register RWrn: Lower 16 bits of data demanded by Monitor 1 (RWwn)</p> <p>Remote register RWrn + 1: Upper 16 bits of data demanded by Monitor 1 (RWwn)</p> <p>Remote register RWrn + 5: Lower 16 bits of data demanded by Monitor 2 (RWwn+2)</p> <p>Remote register RWrn + 6: Upper 16 bits of data demanded by Monitor 2 (RWwn+2)</p> <p>Remote register RWrn+2: Respond code indicating normal or error</p>	RYn8	RYn8																																																																																																												
Instruction code execution demand (COR)	<p>Turning RYn9 (COR) ON executes the processing corresponding to the instruction code stored in remote register RWwn+2.</p> <p>After completion of instruction code execution, the respond code indicating normal or error is set to RWrn+2. At the same time, RXn9 (COR) turns ON.</p> <p>Refer to section 3.5.4 for details.</p>	RYn9	RYn9																																																																																																												
Point table No. selection 1 (DI0)	The point table No. and the home position return are selected by RYnA to RY(n+2)5 (DI0 to DI7).	RYnA	RYnA	*1 *2																																																																																																											
Point table No. selection 2 (DI1)	<table border="1"> <thead> <tr> <th rowspan="2">Point table No.</th> <th colspan="8">(Note 1) Remote input</th> </tr> <tr> <th>RY (n+2)5</th> <th>RY (n+2)4</th> <th>RY (n+2)3</th> <th>RYnE</th> <th>RYnD</th> <th>RYnC</th> <th>RYnB</th> <th>RYnA</th> </tr> </thead> <tbody> <tr> <td>(Note 2)</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> </tr> <tr> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> </tr> <tr> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> </tr> <tr> <td>254</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>255</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <p>Note 1. 0: OFF 1: ON 2. Home position return is a setting</p>	Point table No.	(Note 1) Remote input								RY (n+2)5	RY (n+2)4	RY (n+2)3	RYnE	RYnD	RYnC	RYnB	RYnA	(Note 2)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	1	1	4	0	0	0	0	0	1	0	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	254	1	1	1	1	1	1	1	0	255	1	1	1	1	1	1	1	1	RYnB	RYnB	
Point table No.			(Note 1) Remote input																																																																																																												
		RY (n+2)5	RY (n+2)4	RY (n+2)3	RYnE	RYnD	RYnC	RYnB	RYnA																																																																																																						
(Note 2)		0	0	0	0	0	0	0	0																																																																																																						
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Point table No. selection 3 (DI2)		RYnC	RYnC																																																																																																												
Point table No. selection 4 (DI3)		RYnD	RYnD																																																																																																												
Point table No. selection 5 (DI4)		RYnE	RYnE																																																																																																												
Point table No. selection 6 (DI5)			RY(n+2)3																																																																																																												
Point table No. selection 7 (DI6)			RY(n+2)4																																																																																																												
Point table No. selection 8 (DI7)			RY(n+2)5																																																																																																												
Clear (CR)	<p>When the parameter No.PD22 setting is "□□□1", the position control counter droop pulses is cleared at the leading edge of RYnF (CR). The pulse width should be 10ms or more.</p> <p>When the parameter No.PD22 setting is "□□□2", the pulses are always cleared while RYnF (CR) is on.</p>	RYnF	RYnF	*1 *2																																																																																																											

Signal name (Device name)	Description	Device No.		Remarks
		1 station occupied	2 stations occupied	
Position instruction demand	When RY(n+2)0 is turned ON, the point table No. or position command data set to remote register RWwn+4/RWwn+5 is set. When it is set to the driver, the respond code indicating normal or error is set to RWrn+2. At the same time, RX(n+2)0 turns ON. Refer to "LECSC Operation Manual", section 3.6.3 for details.		RY(n+2)0	
Speed instruction demand	When RY(n+2)1 is turned ON, the point table No. or speed command data set to remote register RWwn+6 is set. When it is set to the driver, the respond code indicating normal or error is set to RWrn+2. At the same time, RX(n+2)1 turns ON. Refer to "LECSC Operation Manual", section 3.6.3 for details.		RY(n+2)1	
Internal torque limit selection (TL1)	Turning RY(n+2)6 (TL1) OFF makes the torque limit value of parameter No.PA11 (forward rotation torque limit) * parameter No.PA12 (reverse rotation torque limit) valid, and turning it ON makes that of parameter No.PC35 (internal torque limit). Refer to "LECSC Operation Manual", section 4.6.3 for details.		RY(n+2)6	* 1
Proportion control (PC)	When RY(n+2)7 (PC) is turned ON, the speed amplifier is switched from the proportional integral type to the proportional type. If the servo motor at a stop is rotated even one pulse by an external factor, it develops torque in an attempt to compensate for a position shift. When the shaft is locked mechanically after Movement completion (RXnC) (MEND) is turned OFF, for example, turning Proportion control (RY(n+2)7) (PC) ON as soon as Movement completion (RXnC) (MEND) turns OFF allows control of unnecessary torque developed in an attempt to compensate for a position shift. When the shaft is to be locked for an extended period of time, turn Internal torque limit selection (RY(n+2)6) (TL1) ON simultaneously with Proportion control (RY(n+2)7) (PC) to make the torque not more than the rated torque using Internal torque limit (parameter No.PC35).		RY(n+2)7	* 1 * 2
Gain changing (CDP)	When RY(n+2)8 (CDP) is turned ON, the load inertia moment ratio and the corresponding gain values change to the values of parameter No.PB29 to PB32. To change the gain using RY(n+2)8 (CDP), make the auto tuning invalid.		RY(n+2)8	* 1
Position/speed specifying system selection	Select how to give a position command/speed command. (Refer to section 3.6.3.) OFF: Remote input-based position/speed specifying system Specifying the point table No. with Point table No. selection (RYnA to RYnE) gives a position command/speed command. ON : Remote register-based position/speed specifying system Setting the instruction code to the remote register (RWwn+4 to RWwn+6) gives a position command/speed command. Set the parameter No.PC30 (direct specification selection) to "□□□2".		RY(n+2)A	

Signal name (Device name)	Description	Device No.		Remarks
		1 station occupied	2 stations occupied	
Absolute value/incremental value selection	<p>RY(n+2)B is made valid when the remote register-based position/speed specifying system is selected with Position/speed specifying system selection (RY(n+2)A) and the absolute value command system is selected in parameter No.PD10. Turn RY(n+2)B OFF or ON to select whether the set position data is in the absolute value command system or incremental value command system.</p> <p>OFF: Position data is handled as an absolute value. ON : Position data is handled as an incremental value.</p>		RY(n+2)B	
Reset (RES)	<p>Keeping RY(n+1)A or RY(n+3)A (RES) ON for 50ms or longer allows an alarm to be deactivated.</p> <p>Some alarms cannot be deactivated by Reset RY(n+1)A or RY(n+3)A (RES). (Refer to section 10.4.1.)</p> <p>If RY(n+1)A or RY(n+3)A (RES) is turned ON with no alarm occurring, the base circuit will not be shut off. When "□□1□" is set in parameter No.PD20 (function selection D-1), the base circuit is shut off.</p> <p>This device is not designed to make a stop. Do not turn it ON during operation.</p>	RY(n+1)A	RY(n+3)A	* 1
Forced stop (EMG)	<p>This device is exclusively used as a CN6 external input signal. It cannot be used for CC-Link.</p> <p>Turn EMG off to bring the motor to an forced stop state, in which the base circuit is shut off and the dynamic brake is operated.</p> <p>Turn EMG on in the forced stop state to reset that state.</p>			

## 6.5.2 Detailed explanation of Output signals (Output devices)

### POINT

- The output devices can be used for both the remote output and the external output signals of CN6 connector.

The signal whose Device No. field has an oblique line cannot be used in CC-Link.

Signal name	Description	Device No	
		1 station occupied	2 stations occupied
Ready (RD)	In the factory-shipped status, a ready is assigned to the CN6-14 pin as an external output signal. RXn0 (RD) turns ON when the driver is ready to operate after servo-on.	RXn0	RXn0
In position (INP)	RXn1 (INP) turns ON when the droop pulse value is within the preset in-position range. The in-position range can be changed using parameter No.PA10. Increasing the in-position range may result in a continuous conduction status during low-speed rotation. RXn1 (INP) turns ON at servo-on.	RXn1	RXn1
Rough match (CP0)	RXn2 (CP0) turns ON when the command remaining distance becomes less than the rough match output range set in the parameter. RXn2 (CP0) turns ON at servo-on.	RXn2	RXn2
Home position return completion (ZP)	In the factory-shipped status, the home position return completion is assigned to the CN6-16 pin as an external output signal. RXn3 (ZP) turns ON when a home position return is completed. RXn3 (ZP) turns ON at completion of a home position return. In an absolute position detection system, RXn3 (ZP) turns ON when operation is ready to start, but turns OFF in any of the following cases. 1) Servo-on (RYn0) (SON) is turned OFF. 2) Forced stop (EMG) is turned OFF. 3) Reset (RY(n+1)A or RY(n+3)A) (RES) is turned ON. 4) Alarm occurs. 5) Forward rotation stroke end (RYn4) (LSP) or Reverse rotation stroke end (RYn5) (LSN) is turned OFF. 6) Home position return has not been made after product purchase. 7) Home position return has not been made after occurrence of Absolute position erase (A25) or Absolute position counter warning (AE3). 8) Home position return has not been made after electronic gear change. 9) Home position return has not been made after the absolute position detection system was changed from invalid to valid. 10) Parameter No.PA14 (Rotation direction selection) has been changed. 11) Software limit is valid. 12) While a home position return is being made. When any of 1) to 12) has not occurred and a home position return is already completed at least once, Home position return completion (RXn3) (ZP) turns to the same output status as Ready (RXn0) (RD).	RXn3	RXn3
Limiting torque (TLC)	RXn4 (TLC) turns ON when the torque is reached at the time of torque generation.	RXn4	RXn4
Electromagnetic brake interlock (MBR)	RXn6 (MBR) turns OFF at servo-off or alarm occurrence. At alarm occurrence, it turns OFF independently of the base circuit status.	RXn6	RXn6
Temporary stop (PUS)	RXn7 (PUS) turns ON when deceleration is started to make a stop by Temporary stop/Restart (RYn7) (TSTP). When Temporary stop/Restart (RYn7) (TSTP) is made valid again to resume operation, RXn7 (PUS) turns OFF.	RXn7	RXn7
Monitoring (MOF)	Refer to Monitor output execution demand (RYn8) (MOR).	RXn8	RXn8

Signal name	Description	Device No																																																																																																			
		1 station occupied	2 stations occupied																																																																																																		
Instruction code execution completion (COF)	Refer to Instruction code execution demand (RYn9) (COR).	RXn9	RXn9																																																																																																		
Warning (WNG)	RXnA (WNG) turns ON when a warning occurs. When no warning has occurred, RXnA (WNG) turns OFF within about 1s after power-on.	RXnA	RXnA																																																																																																		
Battery warning (BWNG)	RXnB (BWNG) turns ON when Open battery cable warning (A92) or Battery warning (A9F) occurs. When no battery warning has occurred, RXnB (BWNG) turns OFF within about 1s after power-on.	RXnB	RXnB																																																																																																		
Movement completion (MEND)	RXnC (MEND) turns ON when In position (RXn1) (INP) turns ON and the command remaining distance is "0". RXnC (MEND) turns ON at servo-on.	RXnC	RXnC																																																																																																		
Dynamic brake interlock (DB)	RXnD (DB) turns off simultaneously when the dynamic brake is operated. When using the external dynamic brake on the driver of 11 kW or more, this device is required. (Refer to section 13.6.) For the driver of 7kw or less, it is not necessary to use this device.	RXnD	RXnD																																																																																																		
Position range (POT)	RXnE (POT) turns ON when the actual current position falls within the range set in the parameter. It is OFF when a home position return is not yet completed or while the base circuit is off.	RXnE	RXnE																																																																																																		
Position instruction execution completion	Refer to Speed instruction execution demand (RY(n+2)0).		RX(n+2)0																																																																																																		
Speed instruction execution completion	Refer to Position instruction execution demand (RY(n+2)1). This device is required when using the external dynamic brake with a driver of 11kW or more. (Refer to section 13.6.) This is not required with drivers of 7kW or less.		RX(n+2)1																																																																																																		
Point table No. output 1 (PT0)	As soon as Movement completion (RXnC) (MEND) turns ON, the point table No. is output in 8-bit code.		RX(n+2)2																																																																																																		
Point table No. output 2 (PT1)	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">Point table No.</th> <th colspan="8">(Note) Remote output</th> </tr> <tr> <th>RX (n+2)9</th> <th>RX (n+2)8</th> <th>RX (n+2)7</th> <th>RX (n+2)6</th> <th>RX (n+2)5</th> <th>RX (n+2)4</th> <th>RX (n+2)3</th> <th>RX (n+2)2</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>2</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>3</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>1</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> <tr> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> </tr> <tr> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> </tr> <tr> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> <td>.</td> </tr> <tr> <td>254</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>0</td> </tr> <tr> <td>255</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table> <p>Note. 0: OFF 1: ON</p>	Point table No.	(Note) Remote output								RX (n+2)9	RX (n+2)8	RX (n+2)7	RX (n+2)6	RX (n+2)5	RX (n+2)4	RX (n+2)3	RX (n+2)2	1	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	1	1	4	0	0	0	0	0	1	0	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	254	1	1	1	1	1	1	1	0	255	1	1	1	1	1	1	1	1		RX(n+2)3
Point table No.			(Note) Remote output																																																																																																		
		RX (n+2)9	RX (n+2)8	RX (n+2)7	RX (n+2)6	RX (n+2)5	RX (n+2)4	RX (n+2)3	RX (n+2)2																																																																																												
1		0	0	0	0	0	0	0	1																																																																																												
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Point table No. output 3 (PT2)			RX(n+2)4																																																																																																		
Point table No. output 4 (PT3)			RX(n+2)5																																																																																																		
Point table No. output 5 (PT4)			RX(n+2)6																																																																																																		
Point table No. output 6 (PT5)			RX(n+2)7																																																																																																		
Point table No. output 7 (PT6)			RX(n+2)8																																																																																																		
Point table No. output 8 (PT7)	<p>RX(n+2)2 to RX(n+2)9 (PT0 to PT7) turn OFF in any of the following statuses.</p> <ul style="list-style-type: none"> <li>▪ Power on</li> <li>▪ Servo off</li> <li>▪ During home position return</li> <li>▪ Home position return completion</li> </ul> <p>In any of the following statuses, RX(n+2)2 to RX(n+2)9 (PT0 to PT7) maintain their pre-change status (ON/OFF).</p> <ul style="list-style-type: none"> <li>▪ When operation mode is changed</li> <li>▪ When Automatic/manual selection (RYn6) (MD0) is turned from OFF to ON or from ON to OFF to change the operation mode.</li> <li>▪ During manual operation</li> <li>▪ During execution of automatic positioning to home position</li> </ul>		RX(n+2)9																																																																																																		

Signal name	Description	Device No	
		1 station occupied	2 stations occupied
Trouble (ALM)	A trouble is assigned to the CN6-15 pin as an external output signal. RX(n+1)A or RX(n+3)A (ALM) turns ON when the protective circuit is activated to shut off the base circuit. When no alarm has occurred, RX(n+1)A or RX(n+3)A (ALM) turns OFF within about 1.5s after power is switched ON.	RX(n+1)A	RX(n+3)A
Remote station communication ready (CRD)	This signal turns ON at power-on and turns off at a trouble occurrence or in the reset (RY(n+1)A or RY(n+3)A) (RES) ON status.	RX(n+1)B	RX(n+3)B

### 6.5.3 Detailed explanation of Remote registers input

The signal whose Remote Register field has an oblique line cannot be used.

Input (Programmable PC or PLC...etc → Driver)

Remote register		Signal name	Description	Setting range
1 station occupied	2 stations occupied			
RWwn	RWwn	Monitor 1	<p>Demands the status indication data of the driver.</p> <p>1) When 1 station is occupied Setting the monitor code of the status indication item to be monitored to RWwn and turning RYn8 to ON sets data to RWrn. RXn8 turns on at the same time.</p> <p>2) When 2 stations are occupied Setting the monitor code of the status indication item to be monitored to RWwn and turning RYn8 to ON sets data to RWrn. RXn8 turns on at the same time.</p> <p>When demanding 32-bit data, specifying the lower 16-bit code No. and turning RYn8 to ON sets the lower 16-bit data to RWwn and the upper 16-bit data to RWrn. Data is stored in the RXn8. RXn8 turns on at the same time.</p> <p>Refer to "LECSC Operation Manual", section 3.5.3, "LECSC Operation Manual (Simplified Edition)", section 6.6 for the item of the monitor code of the status indication.</p>	<p>Refer to "LECSC Operation Manual", section 3.5.3</p> <p>Refer to "LECSC Operation Manual (Simplified Edition)", section 6.6</p>
RWwn+1	RWwn+1	Monitor 2	<p>Demands the status indication data of the driver.</p> <p>1) When 1 station is occupied Setting the monitor code of the status indication item to be monitored to RWwn+1 and turning RYn8 to ON sets data to RWrn+1. RXn8 turns on at the same time.</p> <p>2) When 2 stations are occupied Setting the monitor code of the status indication item to be monitored to RWwn+1 and turning RYn8 to ON sets data to RWrn+5. RXn8 turns on at the same time.</p> <p>When demanding 32-bit data, specifying the lower 16-bit code No. and turning RYn8 to ON sets the lower 16-bit data to RWwn+5 and the upper 16-bit data to RWrn+6. Data is stored in the RXn8. RXn8 turns on at the same time.</p> <p>Refer to "LECSC Operation Manual", section 3.5.3, "LECSC Operation Manual (Simplified Edition)", section 6.6 for the item of the monitor code of the status indication.</p>	<p>Refer to "LECSC Operation Manual", section 3.5.3</p> <p>Refer to "LECSC Operation Manual (Simplified Edition)", section 6.6</p>

Remote register		Signal name	Description	Setting range
1 station occupied	2 stations occupied			
RWwn+2	RWwn+2	Instruction code	<p>Sets the instruction code used to perform parameter or point table data read and write, alarm reference or the like.</p> <p>Setting the instruction code No. to RWwn+2 and turning RYn9 to ON executes the instruction. RXn9 turns to ON on completion of instruction execution.</p> <p>Refer to "LECSC Operation Manual", section 3.5.4 (1), (2), LECSC Operation Manual (Simplified Edition)", section 6.7, 6.8 for instruction code No. definitions.</p>	<p>Refer to "LECSC Operation Manual", section 3.5.4 (1), (2)</p> <p>Refer to "LECSC Operation Manual (Simplified Edition)", section 6.7, 6.8</p>
RWwn+3	RWwn+3	Writing data	<p>Sets the written data used to perform parameter or point table data write, alarm history clear or the like.</p> <p>Setting the written data to RWwn+3 and turning RYn9 to ON writes the data to the driver. RXn9 turns to ON on completion of write.</p> <p>Refer to "LECSC Operation Manual", section 3.5.4 (2), LECSC Operation Manual (Simplified Edition)", section 6.8 for instruction code No. definitions.</p>	<p>Refer to "LECSC Operation Manual", section 3.5.4 (2)</p> <p>Refer to "LECSC Operation Manual (Simplified Edition)", section 6.8</p>
	RWwn+4	Point table No./Position command data lower 16 bit	<p>Set the point table No. to be executed in the automatic operation mode when 2 stations are occupied.</p> <p>When the point table No. is set to RWwn+4 and RY(n+2)0 is turned ON, the point table No. is set to the driver. On completion of setting, RX(n+2)0 turns ON.</p> <p>When the point table is not used, set the position command data.</p> <p>When the lower 16 bits are set to RWwn+4 and the upper 16 bits to RWwn+5, and RY(n+2)0 is turned ON, the position command data in the upper and lower 16 bits are written. On complete of write, RX(n+2)0 turns ON.</p> <p>Use parameter No.PC30 to select whether point table No. setting or position command data setting will be made. Refer to section 3.6.3 for details of Point table No./Position command data.</p>	<p>Point table No.: 0 to 255</p> <p>Absolute value command: Position command data: - 999999 to 999999</p> <p>Incremental value command: Position command data: 0 to 999999</p>
	RWwn+5	Position command data upper 16 bit	<p>Use parameter No.PC30 to select whether point table No. setting or position command data setting will be made. Refer to section 3.6.3 for details of Point table No./Position command data.</p>	<p>Refer to "LECSC Operation Manual", section 3.6.3</p>
	RWwn+6	Point table No./Speed command data	<p>When the point table is not used, set the point table No. to be executed or the speed command data (servo motor speed [r/min]).</p> <p>When the point table No. is set to RWwn+6 and RY(n+2)1 is turned ON, the point table No. or speed command data is set to the driver. On completion of setting, RX(n+2)1 turns ON.</p> <p>Use parameter No.PC30 to select whether point table No. setting or speed command data setting will be made. Refer to section 3.6.3 for details of Point table No./Speed command data.</p> <p>When setting the servo motor speed in this remote register, always set the acceleration/deceleration time constant in the point table No.1.</p>	<p>Point table No.: 0 to 255</p> <p>Speed command data: 0 to Allowed Speed for each actuator</p> <p>Refer to "LECSC Operation Manual", section 3.6.3</p>

## 6.5.4 Detailed explanation of Remote registers output

Output (Driver → Programmable PC or PLC...etc)

Note that the data set to RW<sub>rn</sub> and RW<sub>rn</sub>+1 depends on whether 1 station or 2 stations are occupied.

If you set inappropriate code No. or data to the remote register input, the error code is set to respond code (RW<sub>rn</sub>+2). Refer to "LECSC Operation Manual", section 3.5.5, "LECSC Operation Manual (Simplified Edition)", section 6.9 for the error code.

### When 1 station is occupied

Remote register	Signal name	Description
RW <sub>rn</sub>	Monitor 1 data	The data of the monitor code set to RW <sub>wn</sub> is set.
RW <sub>rn</sub> +1	Monitor 2 data	The data of the monitor code set to RW <sub>wn</sub> +1 is set.
RW <sub>rn</sub> +2	Respond code	"0000" is set when the codes set to RW <sub>wn</sub> to RW <sub>wn</sub> +3 are executed normally.
RW <sub>rn</sub> +3	Reading data	Data corresponding to the read code set to RW <sub>wn</sub> +2 is set.

### When 2 stations are occupied

Remote register	Signal name	Description
RW <sub>rn</sub>	Monitor 1 data lower 16bit	The lower 16 bits of the data of the monitor code set to RW <sub>wn</sub> are set.
RW <sub>rn</sub> +1	Monitor 1 data upper 16bit	The upper 16 bits of the data of the monitor code set to RW <sub>wn</sub> are set. A sign is set if there are no data in the upper 16 bits.
RW <sub>rn</sub> +2	Respond code	"0000" is set when the codes set to RW <sub>wn</sub> to RW <sub>wn</sub> +6 are executed normally.
RW <sub>rn</sub> +3	Reading data	Data corresponding to the read code set to RW <sub>wn</sub> +2 is set.
RW <sub>rn</sub> +4		
RW <sub>rn</sub> +5	Monitor 2 data lower 16bit	The lower 16 bits of the data of the monitor code set to RW <sub>wn</sub> +1 are set.
RW <sub>rn</sub> +6	Monitor 2 data upper 16bit	The upper 16 bits of the data of the monitor code set to RW <sub>wn</sub> +1 are set. A sign is set if there are no data in the upper 16 bits.
RW <sub>rn</sub> +7		

## 6.6 Monitor1 (RWwn) · Monitor2 (RWwn+1)

To demand 32-bit data when 2 stations are occupied, specify the lower 16-bit code No.

Use any of the read instruction codes (0101 to 011C) to read the decimal point position (multiplying factor) of the status indication.

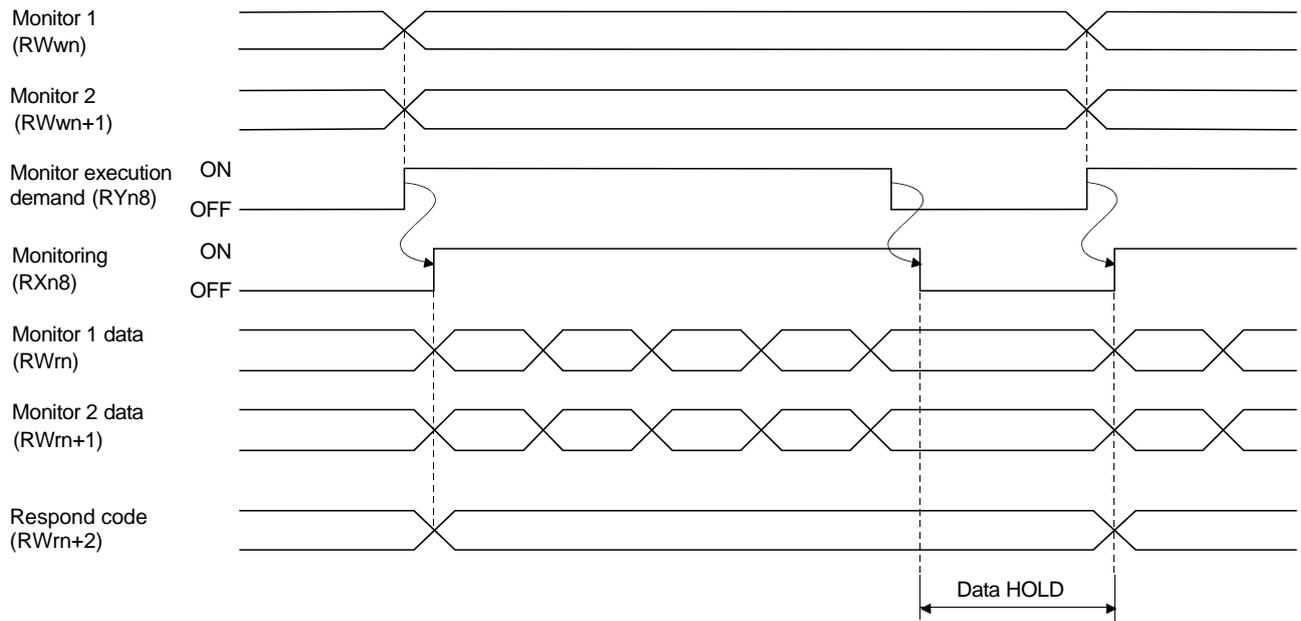
Setting any code No. that is not given in this section will set the error code (□□1□) to respond code (RWrn+2). At this time, "0000" is set to RWrn, RWrn+1, RWrn+5 and RWrn+6.

Monitor Code No.		Monitored item	Answer Monitor1 data, Monitor2 data (RWrn, RWrn+1, RWrn+5 and RWrn+6) (Driver → Programmable PC or PLC...etc)	
1 station occupied	2 stations occupied		Data length	Unit
0000h	0000h			
0001h	0001h	Current position lower 16bit	16bit	×10 <sup>STM</sup> [mm] or ×10 <sup>STM</sup> [inch]
0002h		Current position upper 16bit	16bit	
0003h	0003h	Command position lower 16bit	16bit	
0004h		Command position upper 16bit	16bit	
0005h	0005h	Command remaining distance lower 16bit	16bit	
0006h		Command remaining distance upper 16bit	16bit	
0007h	0007h			
0008h	0008h	Point table No.	16bit	[No.]
0009h				
000Ah	000Ah	Feedback pulse value lower 16bit	16bit	[pulse]
000Bh		Feedback pulse value upper 16bit	16bit	[pulse]
000Ch				
000Dh				
000Eh	000Eh	Droop pulse value lower 16bit	16bit	[pulse]
000Fh		Droop pulse value upper 16bit	16bit	[pulse]
0010h	0010h			
0011h	0011h	Regenerative load factor	16bit	[%]
0012h	0012h	Effective load factor	16bit	[%]
0013h	0013h	Peak load factor	16bit	[%]
0014h		Instantaneously occurring torque	16bit	[%]
0015h	0015h	ABS counter	16bit	[rev]
0016h	0016h	Motor speed lower 16bit	16bit	×0.1[rev/min]
0017h		Motor speed upper 16bit	16bit	×0.1[rev/min]
0018h	0018h	Bus voltage	16bit	[V]
0019h	0019h	ABS position lower 16bit	16bit	[pulse]
001Ah		ABS position middle 16bit	16bit	[pulse]
001Bh	001Bh	ABS position upper 16bit	16bit	[pulse]
001Ch	001Ch	Within one-revolution position lower 16bit	16bit	[pulse]
001Dh		Within one-revolution position upper 16bit	16bit	[pulse]

Refer to "LECSC Operation Manua (Simplified Edition)", Section 6.6.1 for the timing chart of monitor.

## 6.6.1 Timing chart of monitor

(1) When 1 station is occupied



Set the Monitor Code No. (0000 to 001D) to Monitor 1 (RWwn) and Monitor 2 (RWwn+1) and turn Monitor output execution demand (RYn8) to ON.

Turning Monitor execution demand (RYn8) to ON sets the next data.

Data are all hexadecimal numbers. At this time, Monitoring (RXn8) turns to ON at the same time.

Monitor data 1 (RWrn): Data demanded by Monitor 1 (RWwn)

Monitor data 2 (RWrn+1): Data demanded by Monitor 2 (RWwn+1)

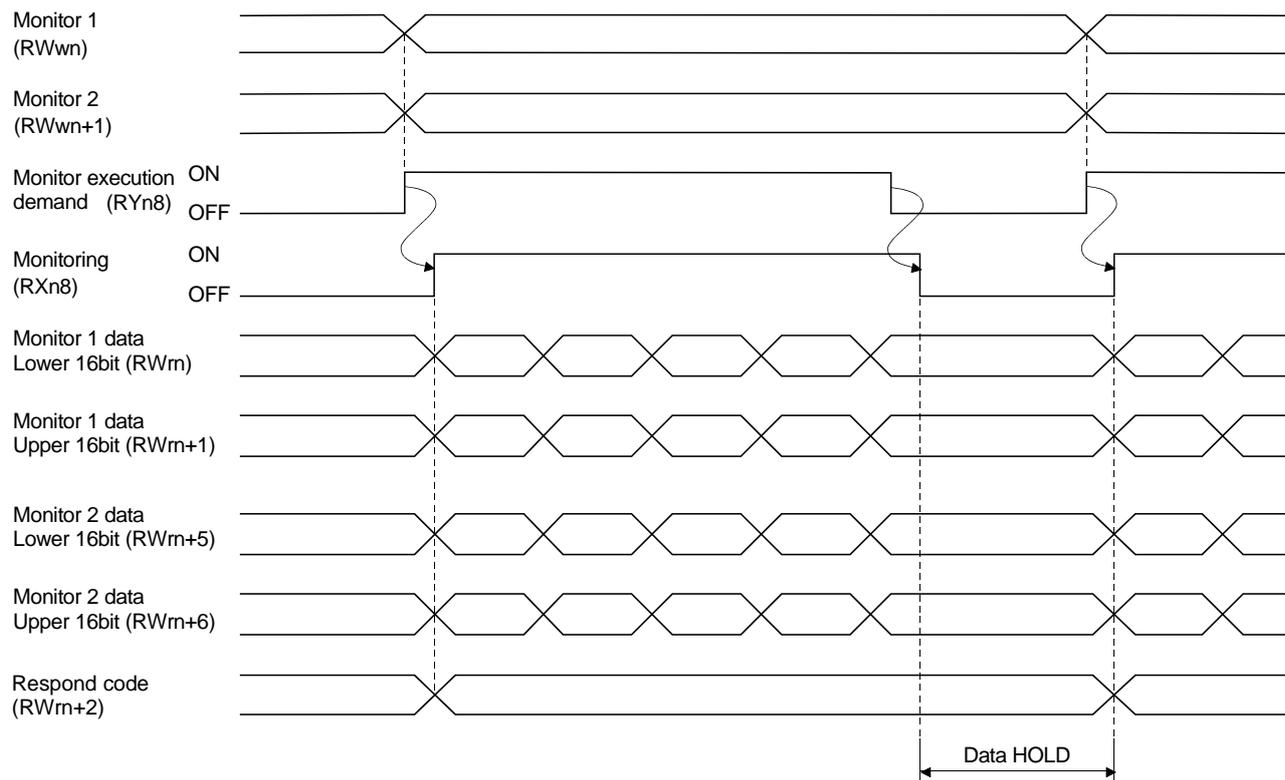
For 32-bit data, set the lower 16 bits of the monitor code to Monitor 1 (RWwn) and the upper 16 bits to Monitor 2 (RWwn+1) and read them simultaneously.

The monitor data set to the remote register are always updated while Monitor execution demand (RYn8) is ON.

When Monitoring (RXn8) turns to OFF, the data set to Monitor data 1 (RWrn), Monitor data 2 (RWrn+1) are held.

If the monitor code not in the specifications is set to either Monitor 1 (RWwn) or Monitor 2 (RWwn+1), the corresponding error code (□□□1) is set to respond code.

(2) When 2 stations are occupied



Set the Monitor Code No. (0000 to 001D) to Monitor 1 (RWwn) and Monitor 2 (RWwn+1) and turn Monitor output execution demand (RYn8) to ON.

Turning Monitor execution demand (RYn8) to ON sets the next data. 32-bit data are all divided into the upper 16 bits and lower 16 bits, and set to the remote register.

Data are all hexadecimal numbers. At this time, Monitoring (RXn8) turns to ON at the same time.

Monitor data 1 lower 16 bit (RWrn) : Lower 16 bits of data demanded by Monitor 1 (RWwn)

Monitor data 1 upper 16 bit (RWrn+1) : Upper 16 bits of data demanded by Monitor 1 (RWwn)

Monitor data 2 lower 16 bit (RWrn+5) : Lower 16 bits of data demanded by Monitor 2 (RWwn+1)

Monitor data 2 upper 16 bit (RWrn+6) : Upper 16 bits of data demanded by Monitor 2 (RWwn+1)

A sign is set if data does not exist in Monitor 1 data upper 16bit (RWrn+1) • Monitor 2 data upper 16bit (RWrn+6).

A "+" sign is indicated by "0000", and "-" by "FFFF".

The monitor data set to the remote register are always updated while Monitoring (RXn8) is ON.

When Monitoring (RXn8) turns to OFF, the data set to Monitor data 1 lower 16 bit (RWrn), Monitor data 1 upper 16 bit (RWrn+1), Monitor data 2 lower 16 bit (RWrn+5), Monitor data 2 upper 16 bit (RWrn+6) are held.

If the monitor code not in the specifications is set to either Monitor 1 (RWwn) or Monitor 2 (RWwn+1), the corresponding error code (□□□1) is set to respond code.

### 6.6.2 Pxrogramming example of the monitor

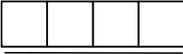
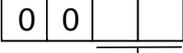
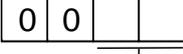
Refer to "LECS Operation Manual", Section 3.7, Section 3.7.4 (1) for the programming example of the monitor.

## 6.7 Read instruction code No. (0000h to 0AFFh)

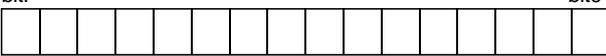
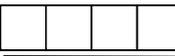
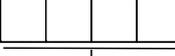
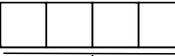
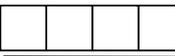
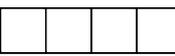
The word data requested to be read with the instruction code No. (0000h to 0AFFh) is read by Read code (RWrn+3). Set the command code No. corresponding to the item to RWrn+2. The codes and answer data are all 4-digit hexadecimal numbers.

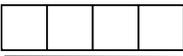
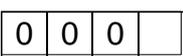
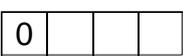
Setting any command code No. that is not given in this section will set the error code (□□1□) to respond code (RWrn+2). At this time, "0000" is set to Reading data (RWrn+3).

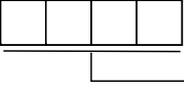
Refer to "LECSC Operation Manua (Simplified Edition)", Section 6.7.1 for the timing charts of read instruction code.

Read instruction code No.	Item/Function	Reading data (RWrn+3) contents (LECSC Driver → Programmable PC or PLC...etc)
0000h	Operation mode Reads the current operation mode.	0000: CC-Link operation mode 0001: Test operation mode
0002h	Travel multiplying factor Reads the multiplying factor of the position data in the point table set in parameter No. PA05.	 <p>Travel multiplying factor</p> <p>0300: ×1000 0200: ×100 0100: ×10 0000: ×1</p>
0010h	Current alarm (warning) reading Reads the alarm No. or warning No. occurring currently.	 <p>Occurring alarm No./warning No.</p>
0020h	Alarm number in alarm history (most recent alarm)	 <p>Alarm No. that occurred in past</p>
0021h	Alarm number in alarm history (first recent alarm)	
0022h	Alarm number in alarm history (second recent alarm)	
0023h	Alarm number in alarm history (third recent alarm)	
0024h	Alarm number in alarm history (fourth recent alarm)	
0025h	Alarm number in alarm history (fifth recent alarm)	 <p>Occurrence time of alarm that occurred in past</p>
0030h	Alarm occurrence time in alarm history (most recent alarm)	
0031h	Alarm occurrence time in alarm history (first recent alarm)	
0032h	Alarm occurrence time in alarm history (second recent alarm)	
0033h	Alarm occurrence time in alarm history (third recent alarm)	
0034h	Alarm occurrence time in alarm history (fourth recent alarm)	
0035h	Alarm occurrence time in alarm history (fifth recent alarm)	



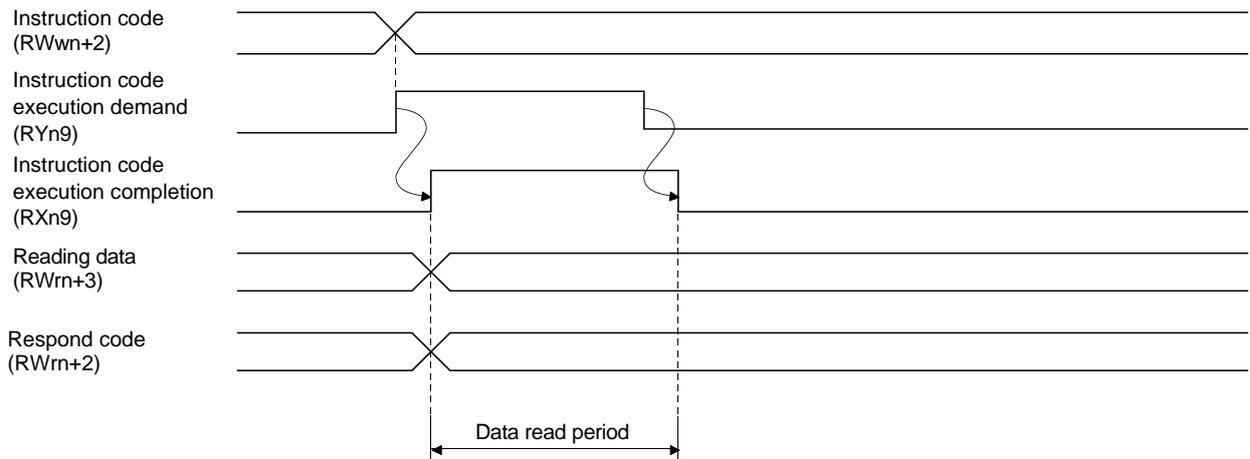
Read instruction code No.	Item/Function	Reading data (RWrn+3) contents (LECS Driver → Programmable PC or PLC...etc)
0052h	Output device status 2 Reads the statuses (OFF/ON) of the Output devices.	bit 0 to bit F indicate the OFF/ON statuses of the corresponding output devices. Refer to section 3.5.1 for the meanings of the abbreviations. <div style="display: flex; justify-content: space-between;"> <span>bitF</span> <span>bit0</span> </div>  <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>bit0: ----</span> <span>bit4: ----</span> <span>bit8: ----</span> <span>bitC: ----</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>bit1: ----</span> <span>bit5: ----</span> <span>bit9: ----</span> <span>bitD: ----</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>bit2: ----</span> <span>bit6: ----</span> <span>bitA: ALM</span> <span>bitE: ----</span> </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <span>bit3: ----</span> <span>bit7: ----</span> <span>bitB: CRD</span> <span>bitF: ----</span> </div>
0081h	Energization time Reads the energization time from shipment.	Returns the energization time [h].  <p style="text-align: center;">Energization time</p>
0082h	Power ON frequency Reads the number of power-on times from shipment.	Returns the number of power-on times.  <p style="text-align: center;">Power ON frequency</p>
00A0h	Ratio of load inertia moment Reads the estimated ratio of load inertia moment to servo motor shaft inertia moment.	Return unit [times].  <p style="text-align: center;">Ratio of load inertia moment</p>
00B0h	Home position within-1-revolution position lower 16bit (CYC0) Reads the lower 16 bits of the cycle counter value of the absolute home position.	Return unit [pulses].  <p style="text-align: center;">Cycle counter value</p>
00B1h	Home position within-1-revolution position upper 16bit Reads the upper 16 bits of the cycle counter value of the absolute home position.	Return unit [pulses].  <p style="text-align: center;">Cycle counter value</p>
00B2h	Home position Multi-revolution data (ABS0) Multi-revolution counter value of absolute home position reading.	Return unit [rev].  <p style="text-align: center;">Multi-revolution counter value</p>
00C0h	Error parameter No./Point data No. reading Reads the parameter No./point table No. in error.	 <p style="text-align: center;">Parameter No. or point table No.</p> <p style="text-align: center;">Parameter group</p> <p style="text-align: center;">0: Basic setting parameters (No.PA□□ )</p> <p style="text-align: center;">1: Gain/filter parameters (No.PB□□ )</p> <p style="text-align: center;">2: Extension setting parameters (No.PC□□ )</p> <p style="text-align: center;">3: I/O setting parameters (No.PD□□ )</p> <p style="text-align: center;">Type</p> <p style="text-align: center;">1: Parameter No.</p> <p style="text-align: center;">2: Point table No.</p>

Read instruction code No.	Item/Function	Reading data (RWrn+3) contents (LECS Driver → Programmable PC or PLC...etc)
0100h to 011Dh	<p>Monitor multiplying factor</p> <p>Reads the multiplying factor of the data to be read with the monitor code.</p> <p>The instruction codes 0100 to 011D correspond to the monitor codes 0000 to 001D.</p> <p>0000 applies to the instruction code that does not correspond to the monitor code.</p>	 <p>Monitor multiplying factor</p> <p>0003: ×1000 0002: ×100 0001: ×10 0000: ×1</p>
0200h	<p>Parameter group reading</p> <p>Reads the parameter group to be read with code No.8200h to be written.</p>	 <p>Parameter group</p> <p>0: Basic setting parameters (No.PA□□) 1: Gain/filter parameters (No.PB□□) 2: Extension setting parameters (No.PC□□) 3: I/O setting parameters (No.PD□□)</p>
0201h (1) to 02FFh (255)	<p>Parameter data reading</p> <p>Reads the set value of each No. of the parameter group read with code No.0200h.</p> <p>The decimal value converted from the 2 lower digits of the code No. corresponds to the parameter No.</p> <p>If the instruction code is set outside the range set in parameter No.PA19, an error code is returned and the data cannot be read.</p>	<p>The value set in the parameter No. corresponding to the requested group name is stored.</p>
0301h (1) to 03FFh (255)	<p>Data form of parameter</p> <p>Reads the data format of each No. of the parameter group read with code No.0200h.</p> <p>The decimal value converted from the 2 lower digits of the code No. corresponds to the parameter No.</p> <p>If the instruction code is set outside the range set in parameter No.PA19, an error code is returned and the data cannot be read.</p>	<p>The value set in the parameter No. corresponding to the requested group name is stored.</p>  <p>Decimal point position</p> <p>0: Without decimal point 1: First least significant digit (without decimal point) 2: Second least significant digit 3: Third least significant digit 4: Fourth least significant digit</p> <p>Data format</p> <p>0: Used unchanged as hexadecimal 1: Must be converted into decimal</p> <p>Parameter write type</p> <p>0: Valid after write 1: Valid when power is switched on again after write</p>
0401h (1) to 04FFh (255)  0501h (1) to 05FFh (255)	<p>Position data of point table No.1 to 255</p> <p>Reads the point table data of point table No.1 to 255.</p> <p>0400 to 04FF: Position data in lower 16 bits of point table No.1 to 255</p> <p>0500 to 05FF: Position data in upper 16 bits of point table No.1 to 255</p> <p>Example</p> <p>Instruction code 0413: Lower 16 bits of point table No.19</p> <p>Instruction code 0513: Upper 16 bits of point table No.19</p>	<p>The position data (upper 16 bits or lower 16 bits) set in the requested point table No. is returned.</p>

Read instruction code No.	Item/Function	Reading data (RWrn+3) contents (LECS Driver → Programmable PC or PLC...etc)
0601h (1) to 06FFh (255)	Servo motor speed of point table No.1 to 255 The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	The servo motor speed set to the requested point table No. is returned.  Servo motor speed
0701h (1) to 07FFh (255)	Acceleration time constant of point table No.1 to 255 The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	The acceleration time constant set to the requested point table No. is returned.
0801h (1) to 08FFh (255)	Deceleration time constant of point table No.1 to 255 The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	The deceleration time constant set to the requested point table No. is returned.
0901h (1) to 09FFh (255)	Dwell of point table No.1 to 255 The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	The dwell set to the requested point table No. is returned.
0A01h (1) to 0AFFh (255)	Auxiliary function of point table No.1 to 255 The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	The Auxiliary function set to the requested point table No. is returned.

## 6.7.1 Timing chart of read instruction code

Read instruction codes (0000h to 0A1Fh)



Set the read instruction code (0000h to 0A1Fh) to Instruction code (RWwn+2) and turn Instruction code execution demand (RYn9) to ON.

Turning Instruction code execution demand (RYn9) to ON sets the data corresponding to the preset read code to Reading data (RWrn+3). Data are all hexadecimal numbers. At this time, Instruction code execution completion (RXn9) turns to ON at the same time.

Read the read data set to Reading data (RWrn+3) while Instruction code execution completion (RXn9) is ON.

The data set to Reading data (RWrn+3) is held until the next read instruction code is set and Instruction code execution demand (RYn9) is turned to ON.

If the instruction code not in the specifications is set to Instruction code (RWwn+2), the corresponding error code ( $\square\square 1\square$ ) is set to respond code. If any unusable parameter, point table is read, the corresponding error code ( $\square\square 2\square$ ) is set.

Turn Instruction code execution demand (RYn9) to OFF after completion of data read.

## 6.7.2 Programming examples of read instruction code

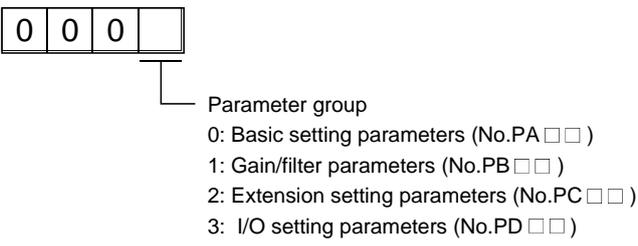
Refer to "LECSC Operation Manua", Section 3.7, Section 3.7.4 for the programming examples of read instruction code.

## 6.8 Write instruction code No. (8010h to 91FFh)

Set the data, which was requested to be written with the write instruction code No. (8010h to 91FFh).

Set the instruction code No. corresponding to the item to Instruction code (RWwn+2) and the written data to Writing data (RWwn+3). The codes and answer data are all 4-digit hexadecimal numbers.

When the instruction code which has not been described in this section is set, the error code (□□1□) is stored in respond code (RWrn+2).

Write instruction Code No.	Item	Writing data (RWwn+3) contents (Programmable PC or PLC...etc → LECS Driver)
8010h	Alarm reset command Deactivates the alarm that occurred.	1EA5
8101h	Feedback pulse value display data is clear Resets the display data of the status indication "feedback pulse value" to 0.	1EA5
8200h	Parameter group write command Writes the group of parameters that are written to with codes No.8201h to 82FFh and 8301h to 83FFh. Writes the group of parameters that are read with codes No.0201h to 02FFh and 0301h to 03FFh.	
8201h (1) to 82FFh (255)	Data RAM instruction of parameter Writes the set value of each No. of the parameter group written by code No.8200h to RAM. These values are cleared when power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the parameter No. An error code is returned if an instruction code outside the range set in parameter No. PA19 or a value outside the setting range of the corresponding parameter is written.	Convert the decimal values into hexadecimal before setting.
8201h (1) to 82FFh (255)	Data RAM instruction of parameter Writes the set value of each No. of the parameter group written by code No.8200h to RAM. These values are cleared when power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the parameter No. An error code is returned if an instruction code outside the range set in parameter No. PA19 or a value outside the setting range of the corresponding parameter is written.	Convert the decimal values into hexadecimal before setting.
8301h (1) to 83FFh (255)	Data EEPROM instruction of parameter Writes the set value of each No. of the parameter group written with code No.8200h to EEPROM. Written to EEPROM, these values are held if power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the parameter No. An error code is returned if an instruction code outside the range set in parameter No. PA19 or a value outside the setting range of the corresponding parameter is written.	Convert the decimal values into hexadecimal before setting.

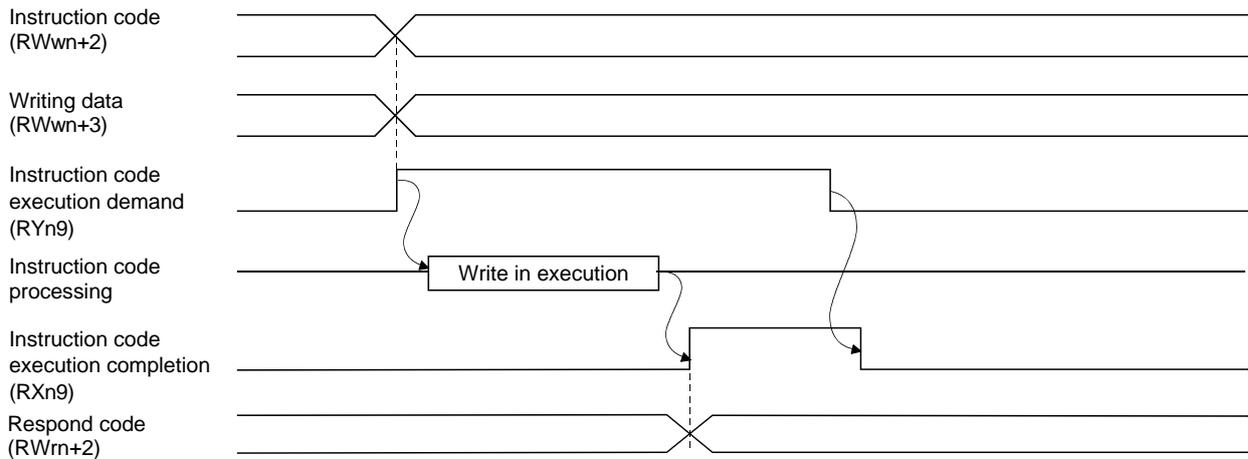
Write instruction Code No.	Item	Writing data (RWwn+3) contents (Programmable PC or PLC...etc → LECS Driver)		
8401h (1) to 84FFh (255)  8501h (1) to 85FFh (255)	Position data RAM command of point table Writes the position data of point table No. 1 to 255 to RAM. These values are cleared when power is switched off.	Convert the values into hexadecimal before setting.		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center; padding: 5px;">Point</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;"> <ul style="list-style-type: none"> <li>▪ A set of the upper and lower bits makes position data. When changing the data, always set the data of both lower and upper bits in order of lower 16-bit data and upper 16-bit data.</li> </ul> <p>8400h to 84FFh: Position data in lower 16 bits of point table No.1 to 255</p> <p>8500h to 85FFh: Position data in upper 16 bits of point table No.1 to 255</p> <p>Example</p> <p>Instruction code 8413h: Lower 16 bits of point table No.19</p> <p>Instruction code 8513h: Upper 16 bits of point table No.19</p> </td> </tr> </tbody> </table>			Point	<ul style="list-style-type: none"> <li>▪ A set of the upper and lower bits makes position data. When changing the data, always set the data of both lower and upper bits in order of lower 16-bit data and upper 16-bit data.</li> </ul> <p>8400h to 84FFh: Position data in lower 16 bits of point table No.1 to 255</p> <p>8500h to 85FFh: Position data in upper 16 bits of point table No.1 to 255</p> <p>Example</p> <p>Instruction code 8413h: Lower 16 bits of point table No.19</p> <p>Instruction code 8513h: Upper 16 bits of point table No.19</p>
Point				
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8601h (1) to 86FFh (255)	Motor speed of point table Writes the motor speeds of point table No.1 to 255 to RAM. These values are cleared when power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.		
8701h (1) to 87FFh (255)	Acceleration time constant data RAM command of point table Writes the acceleration time constants of point table No.1 to 255 to RAM. These values are cleared when power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.		
8801h (1) to 88FFh (255)	Deceleration time constant data RAM command of point table Writes the deceleration time constants of point table No.1 to 255 to RAM. These values are cleared when power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.		
8901h (1) to 89FFh (255)	Dwell data RAM command of point table Writes the dwell data of point table No.0 to 255 to RAM. These values are cleared when power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.		
8A01h (1) to 8AFFh (255)	Auxiliary function data RAM command of point table Writes the auxiliary function data of point table No.0 to 31 to RAM. These values are cleared when power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.		

Write instruction Code No.	Item	Writing data (RWwn+3) contents (Programmable PC or PLC...etc → LECS Driver)		
8B01h (1) to 8BFFh (255)  8C01h (1) to 8CFFh (255)	Position data EEPROM command of point table Writes the position data of point table No.1 to 255 to EEPROM. Written to EEPROM, these values are held if power is switched off.	Convert the values into hexadecimal before setting.		
	<table border="1"> <thead> <tr> <th>Point</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>A set of the upper and lower bits makes position data. When changing the data, always set the data of both lower and upper bits in order of lower 16-bit data and upper 16-bit data.</li> </ul> <p>8B01h to 8BFFh: Position data in lower 16 bits of point table No.1 to 255 8C01h to 8CFFh: Position data in upper 16 bits of point table No.1 to 255</p> <p>Example</p> <p>Instruction code 8B13h: Lower 16 bits of point table No.19 Instruction code 8C13h: Upper 16 bits of point table No.19</p> </td> </tr> </tbody> </table>	Point	<ul style="list-style-type: none"> <li>A set of the upper and lower bits makes position data. When changing the data, always set the data of both lower and upper bits in order of lower 16-bit data and upper 16-bit data.</li> </ul> <p>8B01h to 8BFFh: Position data in lower 16 bits of point table No.1 to 255 8C01h to 8CFFh: Position data in upper 16 bits of point table No.1 to 255</p> <p>Example</p> <p>Instruction code 8B13h: Lower 16 bits of point table No.19 Instruction code 8C13h: Upper 16 bits of point table No.19</p>	
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<ul style="list-style-type: none"> <li>A set of the upper and lower bits makes position data. When changing the data, always set the data of both lower and upper bits in order of lower 16-bit data and upper 16-bit data.</li> </ul> <p>8B01h to 8BFFh: Position data in lower 16 bits of point table No.1 to 255 8C01h to 8CFFh: Position data in upper 16 bits of point table No.1 to 255</p> <p>Example</p> <p>Instruction code 8B13h: Lower 16 bits of point table No.19 Instruction code 8C13h: Upper 16 bits of point table No.19</p>				
8D01h (1) to 8DFFh (255)	Servo motor speed data EEPROM command of point table Writes the servo motor speeds of point table No.1 to 255 to EEPROM. Written to EEPROM, these values are held if power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.		
8E01h (1) to 8EFFh (255)	Acceleration time constant data EEPROM command of point table Writes the acceleration time constants of point table No.1 to 255 to EEPROM. Written to EEPROM, these values are held if power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.		
8F01h (1) to 8FFFh (255)	Deceleration time constant data EEPROM command of point table Writes the deceleration time constants of point table No.1 to 255 to EEPROM. Written to EEPROM, these values are held if power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.		
9001h (1) to 90FFh (255)	Dwell data EEPROM command of point table Writes the dwell data of point table No.1 to 255 to EEPROM. Written to EEPROM, these values are held if power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.		

Write instruction Code No.	Item	Writing data (RWwn+3) contents (Programmable PC or PLC...etc → LECSC Driver)
9101h (1) to 91FFh (255)	Auxiliary function data EEPROM command of point table Writes the auxiliary function data of point table No.1 to 255 to EEPROM. Written to EEPROM, these values are held if power is switched off. The decimal value converted from the 2 lower digits of the code No. corresponds to the point table No.	Convert the values into hexadecimal before setting.

### 6.8.1 Timing chart of write instruction code

Write instruction codes (8000h to 911Fh)



Set the write instruction code (8000h to 911Fh) to Instruction code (RWwn+2) and the data to be written (data to be executed) to Writing data (RWwn+3) in hexadecimal, and turn Instruction code execution demand (RYn9) to ON.

Turning instruction code execution completion to ON sets the data set in Writing data (RWwn+3) to the item corresponding to the write instruction code. When write is executed, Instruction code execution completion (RXn9) turns to ON.

If the instruction code not in the specifications is set to Instruction code (RWwn+2), the corresponding error code (□□1□) is set to respond code.

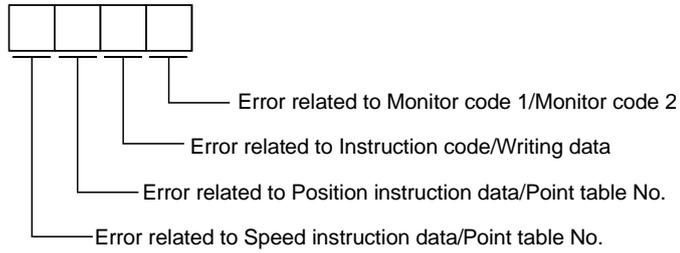
Turn Instruction code execution demand (RYn9) to OFF after Instruction code execution completion (RXn9) has turned to ON.

### 6.8.2 Programming examples of write instruction code

Refer to "LECSC Operation Manua", Section 3.7, Section 3.7.5 for the programming examples of write instruction code.

## 6.9 Respond codes (RW<sub>rn</sub>+2)

If any of the monitor codes, instruction codes, position command data/point table Nos., speed command data/point table Nos. set to the remote register is outside the setting range, the corresponding error code is set to respond code (RW<sub>wn</sub>+2). "0000" is set if they are normal.



Code No.	Error	Details
0	Normal answer	Instruction was completed normally.
1	Code error	<ul style="list-style-type: none"> <li>The monitor code not in the specifications was set.</li> <li>Read/write of the point table of No.255 or later was set.</li> </ul>
2	Parameter ▪ point table selection error	<ul style="list-style-type: none"> <li>The parameter No. disabled for reference was set.</li> </ul>
3	Write range error	<ul style="list-style-type: none"> <li>An attempt was made to write the parameter or point table data outside the setting range.</li> </ul>

## 7. Home position return

Driver has the function to return to origin. The home position return type is set by the driver parameter. When incremental type is selected, returning to home position is necessary every time the input power supply is turned on.

Refer to "LESC Operation Manual", chapter 5 for details.

### 7.1 Setting of home position return

Select the way of returning to home position

#### (1) Select the way of returning to home position

Set parameter: [PC02]

\* To set [PC\*\*], set parameter write inhibit [PA19] to "000C".

Home position return parameter

When performing home position return, set each parameter as follows.

Choose the home position return method with parameter No.PC02 (Home position return type).

Parameter No.PC02

0	0	0	
---	---	---	--

- └ Home position return method
- 0: Dog type
  - 1: Count type
  - 2: Data setting type
  - 3: Stopper type
  - 4: Home position ignorance (Servo-on position as home position)
  - 5: Dog type rear end reference
  - 6: Count type front end reference
  - 7: Dog cradle type
  - 8: Dog type first Z-phase reference
  - 9: Dog type front end reference
  - A: Dogless Z-phase reference

EX.) Pushing type is selected for the way of returning to home position.

[PC02] = 0003

## 7.1.1 Home position return

### Home position return types

Choose the optimum home position return according to the machine type, etc.

Type	Home position return method	Features
Dog type home position return	With deceleration started at the front end of a proximity dog, the position where the first Z-phase signal is given past the rear end of the dog or a motion has been made over the home position shift distance starting from the Z-phase signal is defined as a home position.	<ul style="list-style-type: none"> <li>• General home position return method using a proximity dog.</li> <li>• Repeatability of home position return is excellent.</li> <li>• The machine is less burdened.</li> <li>• Used when the width of the proximity dog can be set greater than the deceleration distance of the servo motor.</li> </ul>
Count type home position return	With deceleration started at the front end of a proximity dog, the position where the first Z-phase signal is given after advancement over the preset moving distance after the proximity dog or a motion has been made over the home position shift distance starting from the Z-phase signal is defined as a home position.	<ul style="list-style-type: none"> <li>• Home position return method using a proximity dog.</li> <li>• Used when it is desired to minimize the length of the proximity dog.</li> </ul>
Data setting type home position return	An arbitrary position is defined as a home position.	<ul style="list-style-type: none"> <li>• No proximity dog required.</li> </ul>
Stopper type home position return	The position where the machine stops when its part is pressed against a machine stopper is defined as a home position.	<ul style="list-style-type: none"> <li>• Since the machine part collides with the machine be fully lowered.</li> <li>• The machine and stopper strength must be increased.</li> </ul>
Home position ignorance (Servo-on position as home position)	The position where servo is switched on is defined as a home position.	
Dog type rear end reference	The position where the axis, which had started decelerating at the front end of a proximity dog, has moved the after-proximity dog moving distance and home position shift distance after it passed the rear end is defined as a home position.	<ul style="list-style-type: none"> <li>• The Z-phase signal is not needed.</li> </ul>
Count type front end reference	The position where the axis, which had started decelerating at the front end of a proximity dog, has moved the after-proximity dog moving distance and home position shift distance is defined as a home position.	<ul style="list-style-type: none"> <li>• The Z-phase signal is not needed.</li> </ul>
Dog cradle type	The position where the first Z-phase signal is issued after detection of the proximity dog front end is defined as a home position.	
Dog type first Z-phase reference	After the proximity dog front end is detected, the current position moves away from the proximity dog in the reverse direction. In this movement, the home position is defined to be where the first Z-phase signal is issued or the position that is the home position shift distance away from where the first Z-phase signal is issued.	
Dog type front end reference	The home position is the front end of the proximity dog.	<ul style="list-style-type: none"> <li>• The Z-phase signal is not needed.</li> </ul>
Dogless Z-phase reference	The home position is defined to be where the first Z-phase signal is issued or the position that is the home position shift distance away from where the first Z-phase signal is issued.	

## 7.1.2 Stopper type home position return.

In stopper type home position return, a machine part is pressed against a stopper or the like by a jog operation to make a home position return and that position is defined as a home position.

After completion of stopper type home position return, please move to any position (Not pressed position) from the pressing position.

If over a certain period of time in the state of the pressing position, an overload alarm (AL 50, AL 51) occurs for driver protection.

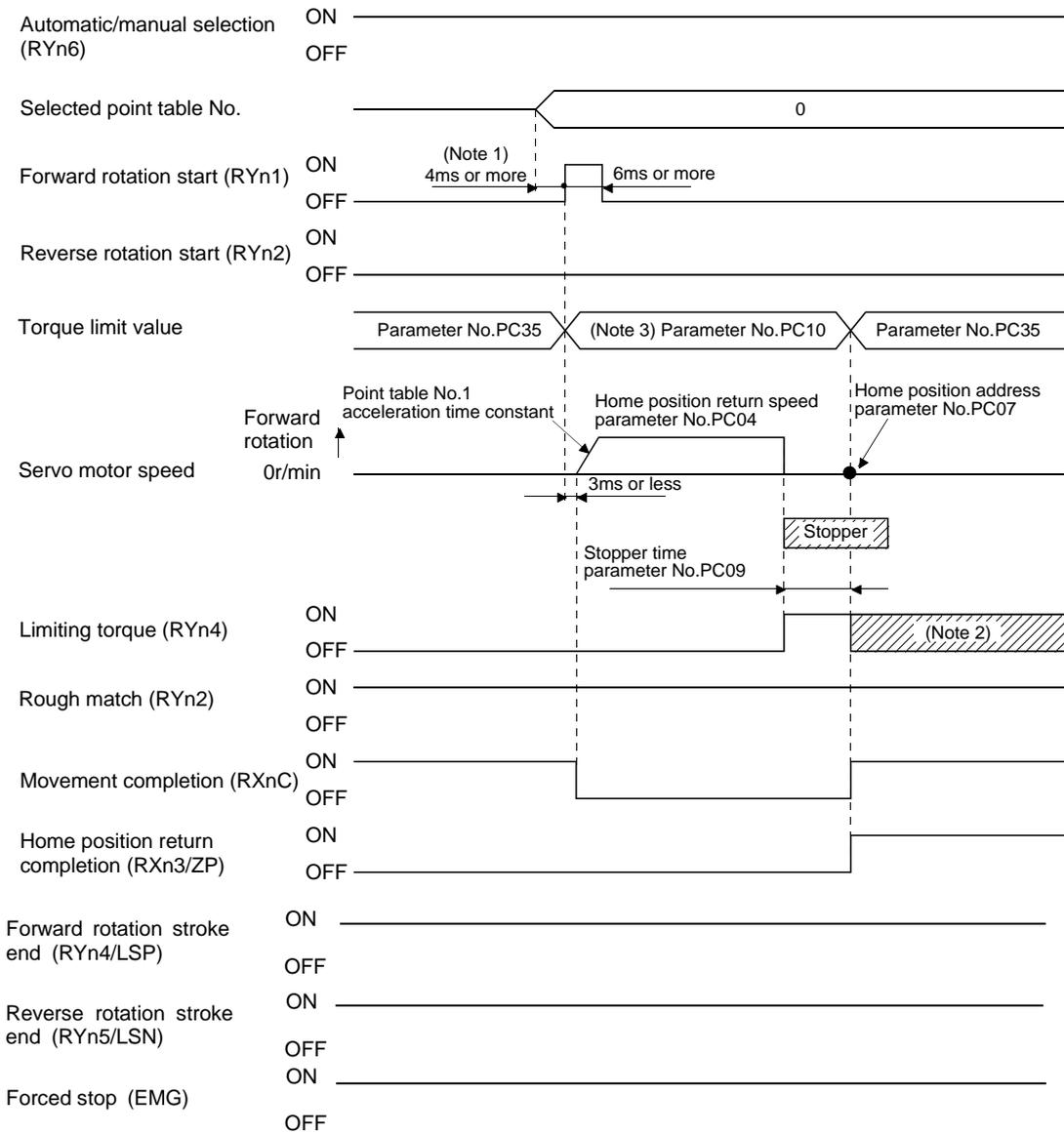
### (1) Devices, parameters

Set the input devices and parameters as follows:

Item	Device/Parameter used	Description
Manual home position return mode selection	Automatic/manual selection (RYn6) (MD0)	Turn RYn6 ON.
	Point table No. selection 1 to 8 (RYnA to RYnE, RY(n+2)3 to RY(n+2)5)	RYnA to RYnE, RY(n+2)3 to RY(n+2)5 are turned off.
Remote register-based position/speed setting (Only when two stations are occupied)	Position/speed specifying system selection (RY(n+2)A)	Turn RY(n+2)A ON.
Stopper type home position return	Parameter No.PC02	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 3: Stopper type home position return is selected.
Home position return direction	Parameter No.PC03	Choose the home position return direction.
Home position return speed	Parameter No.PC04	Set the speed till contact with the stopper.
Stopper time	Parameter No.PC09	Time from when the part makes contact with the stopper to when home position return data is obtained to output home position return completion (ZP).
Stopper type home position return torque limit value	Parameter No.PC10	Set the servo motor torque limit value for execution of stopper type home position return.
Home position return acceleration time constant	Point table No.1	Use the acceleration time constant of point table No.1.
Home position return position data	Parameter No.PC07	Set the current position at home position return completion.

\* To set [PC\*\*], set parameter write inhibit [PA19] to "000C".

(2) Time chart of stopper type home position return  
Time chart of stopper type home position return.



- Note 1. Configure a sequence that changes the point table selection earlier, considering the delay time of CC-Link communication.  
 Note 2. Turns ON when the torque reaches the value set to Forward rotation torque limit (parameter No.PA11), Reverse rotation torque limit (parameter No.PA12) or Internal torque limit (parameter No.PC35).  
 Note 3. The torque limit that is enabled at this point is as follows.

(Note) Internal torque limit selection (RY(n+2)6)	Limit value status	Torque limit to be enabled
0		Parameter No.PC10
1	Parameter No.PC35 > Parameter No.PC10	Parameter No.PC10
	Parameter No.PC35 < Parameter No.PC10	Parameter No.PC35

Note. 0: OFF  
1: ON

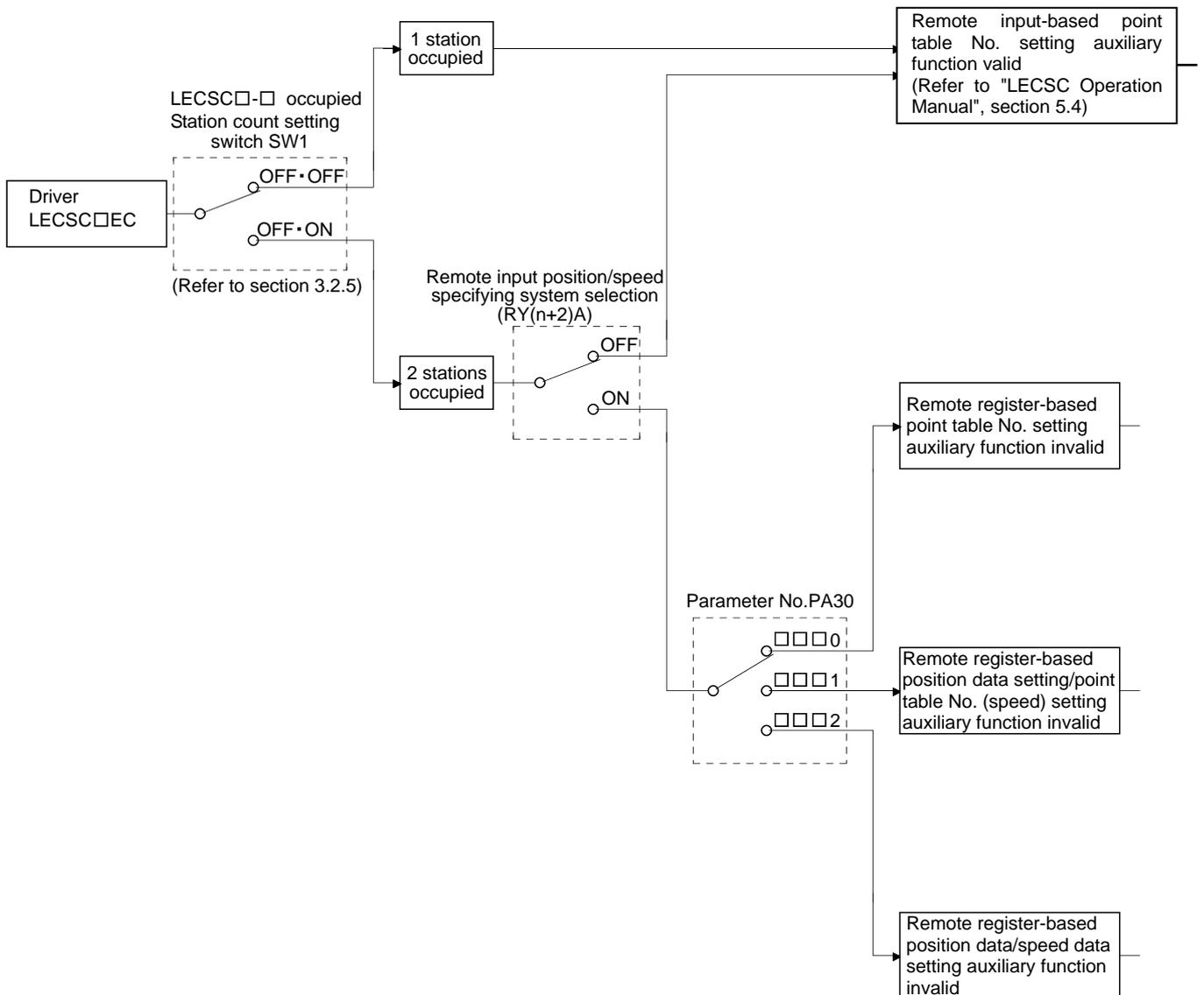
The parameter No.PC07 (home position return position data) setting value is the positioning address after the home position return is completed.

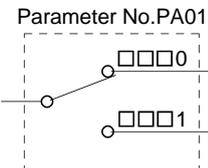
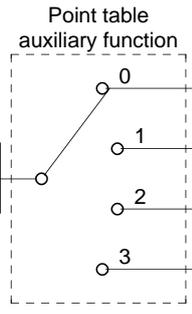
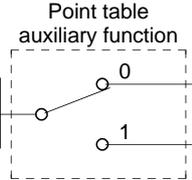
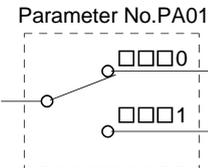
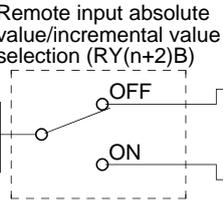
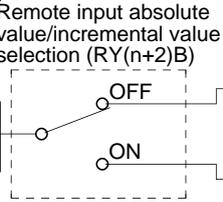
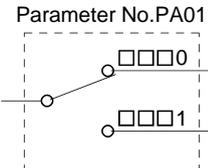
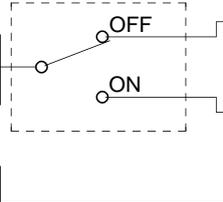
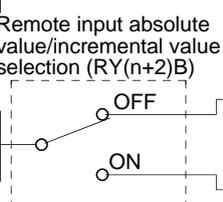
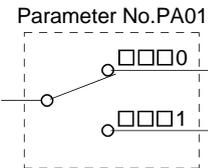
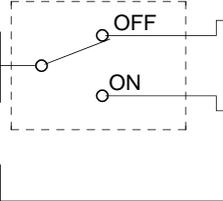
Refer to "LESC Operation Manual", section 5.6 for the details of the timing chart for the stopper type home position return.

## 8. Positioning operation method of operation

The operation method changes depending on the input device, parameter and point table setting.

The flow of the operation method that changes depending on the device and parameter setting status is shown in the chart for your reference.



		Reference	Main description
Parameter No.PA01 	Absolute value command specifying system 	Positioning operation is executed once with position data handled as absolute value.	"LESC Manual" Section 3.8.2 Section 5.4.2 (1)
		Continuous positioning operation is executed with position data handled as absolute values.	"LESC Manual" Section 3.8.2 Section 5.4.2 (4)(b)1
	Incremental value command specifying system 	Positioning operation is executed once with position data handled as incremental value.	"LESC Manual" Section 3.8.2 Section 5.4.2 (2)
		Continuous positioning operation is executed with position data handled as incremental values.	"LESC Manual" Section 3.8.2 Section 5.4.2 (4)(b)1
Parameter No.PA01 	Absolute value command specifying system 	Positioning operation is executed once in incremental value command system.	"LESC Manual" Section 3.8.2 Section 5.4.2 (1)
		Continuous positioning operation is executed in incremental value command system.	"LESC Manual" Section 3.8.2 Section 5.2.2 (4)(b)2
	Incremental value command specifying system 	Positioning operation is executed once with position data handled as absolute value.	"LESC Manual" Section 3.6.3 (1)
		Positioning operation is executed once with position data handled as incremental value.	Section 3.7.6 (3)
Parameter No.PA01 	Absolute value command specifying system 	Positioning operation is executed once with position data handled as absolute value.	"LESC Manual" Section 3.6.3 (2)
		Positioning operation is executed once with position data handled as incremental value.	"LESC Manual" Section 3.6.3 (2)
	Incremental value command specifying system 	Positioning operation is executed once in incremental value command system.	"LESC Manual" Section 3.6.3(3) Section 3.8.4 Section 5.4.3(1)
		Positioning operation is executed once with position data handled as absolute value.	Section 3.6.3 (3) Section 5.4.3 (2)
Parameter No.PA01 	Absolute value command specifying system 	Positioning operation is executed once with position data handled as incremental value.	"LESC Manual" Section 3.6.3(3) Section 3.7.6(2) Section 5.4.3(3)
		Positioning operation is executed once in incremental value command system.	"LESC Manual" Section 3.6.3(3) Section 3.7.6(2) Section 5.4.3(3)
	Incremental value command specifying system		Positioning operation is started by making the start signal valid after selection of the point table with the remote register. The auxiliary function cannot be used.

## 8.1 Point table method

Positioning is performed according to the point table data (Target position, Rotation speed, Acceleration time constant, and Deceleration time constant) in the driver.

(When the point table occupies 1 station, a maximum of 31 points are usable. 255 points become usable when 2 stations are occupied.)

See “LESCS Operation Manual (Simplified Edition)”, section 5.7 for Point table data.

### 8.1.1 Positioning operation indication of the point table method (Example)

#### (1) Positioning operation indication of the point table method and Parameters, device

Choosing the point table using (RYnA to RYnE, RY(n+2)3 to RY(n+2)5 / DI0 to DI7) and turning Forward rotation start (RYn1/ST1) or Reverse rotation start (RYn2/ST2) ON.

Positioning operation start to the target Position, rotation speed, acceleration time constant, deceleration time constant.

Please set the device and parameters.

Item	Setting method	Description
Command system	Control mode (Parameter No.PA01)	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 0: Absolute value command system. <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 1: Incremental value command system.
Automatic operation mode selection (MD0)	Automatic/manual selection (RYn6)	Turn RYn6 ON.
Point table selection (DI0 to DI7)	Point table No. selection 1 (RYnA) Point table No. selection 2 (RYnB) Point table No. selection 3 (RYnC) Point table No. selection 4 (RYnD) Point table No. selection 5 (RYnE) Point table No. selection 6 (RY(n.2)3) Point table No. selection 7 (RY(n.2)4) Point table No. selection 8 (RY(n.2)5)	Turn RYnA to RYnE, (RY(n.2)3) to (RY(n.2)5) ON / OFF.
Forward rotation start (ST1) Reverse rotation start (ST2)	Forward rotation start (RYn1) Reverse rotation start (RYn 2)	Turn RYn1 / RYn2 ON to start.

#### (2) Selection of command system (PA01)

Select the command system.

Parameter No.PA01  

0	0	0	
---	---	---	--

└ Selection of command system

0: Absolute value command system  
1: Incremental value command system

#### (3) Selection of automatic/manual (MD0)

Signal name (Device name)	Description	Device No.		Remarks
		1 station occupied	2 stations occupied	
Automatic/manual selection (MD0)	Turning RYn6 ON selects the automatic operation mode, and turning it OFF selects the manual operation mode.	RYn6	RYn6	* 1

\*1: Can be used as external input signals of CN6 connector by setting parameters No.PD06 to PD08 and parameter No.PD12 to PD14.

(4) Selection of point table No. (DI0 to DI7)

Signal name (Device name)	Description	Device No.		Remarks																																																																																																											
		1 station occupied	2 stations occupied																																																																																																												
Point table No. selection 1 (DI0)	The point table No. and the home position return are selected by RYnA to RY(n+2)5. <table border="1" style="margin: 10px auto; width: 80%;"> <thead> <tr> <th rowspan="2">Point table No.</th> <th colspan="8">(Note 1) Remote input</th> </tr> <tr> <th>RY (n+2)5</th> <th>RY (n+2)4</th> <th>RY (n+2)3</th> <th>RYnE</th> <th>RYnD</th> <th>RYnC</th> <th>RYnB</th> <th>RYnA</th> </tr> </thead> <tbody> <tr> <td>(Note 2)</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td> </tr> <tr> <td>1</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td> </tr> <tr> <td>2</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td> </tr> <tr> <td>3</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>1</td> </tr> <tr> <td>4</td> <td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>1</td><td>0</td><td>0</td> </tr> <tr> <td>·</td> <td>·</td><td>·</td><td>·</td><td>·</td><td>·</td><td>·</td><td>·</td><td>·</td> </tr> <tr> <td>·</td> <td>·</td><td>·</td><td>·</td><td>·</td><td>·</td><td>·</td><td>·</td><td>·</td> </tr> <tr> <td>·</td> <td>·</td><td>·</td><td>·</td><td>·</td><td>·</td><td>·</td><td>·</td><td>·</td> </tr> <tr> <td>254</td> <td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>0</td> </tr> <tr> <td>255</td> <td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td> </tr> </tbody> </table> <p style="font-size: small; margin-top: 5px;">                     Note 1. 0: OFF 1: ON                      2. Home position return is a setting                 </p>	Point table No.	(Note 1) Remote input								RY (n+2)5	RY (n+2)4	RY (n+2)3	RYnE	RYnD	RYnC	RYnB	RYnA	(Note 2)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	1	0	3	0	0	0	0	0	0	1	1	4	0	0	0	0	0	1	0	0	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	·	254	1	1	1	1	1	1	1	0	255	1	1	1	1	1	1	1	1	RYnA	RYnA	* 1 * 2
Point table No.			(Note 1) Remote input																																																																																																												
		RY (n+2)5	RY (n+2)4	RY (n+2)3	RYnE	RYnD	RYnC	RYnB	RYnA																																																																																																						
(Note 2)		0	0	0	0	0	0	0	0																																																																																																						
1		0	0	0	0	0	0	0	1																																																																																																						
2		0	0	0	0	0	0	1	0																																																																																																						
3		0	0	0	0	0	0	1	1																																																																																																						
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255	1	1	1	1	1	1	1	1																																																																																																							
Point table No. selection 2 (DI1)	RYnB	RYnB																																																																																																													
Point table No. selection 3 (DI2)	RYnC	RYnC																																																																																																													
Point table No. selection 4 (DI3)	RYnD	RYnD																																																																																																													
Point table No. selection 5 (DI4)	RYnE	RYnE																																																																																																													
Point table No. selection 6 (DI5)	/	RY(n+2)3																																																																																																													
Point table No. selection 7 (DI6)	/	RY(n+2)4																																																																																																													
Point table No. selection 8 (DI7)	/	RY(n+2)5																																																																																																													

\*1: Can be used as external input signals of CN6 connector by setting parameters No.PD06 to PD08 and parameter No.PD12 to PD14.

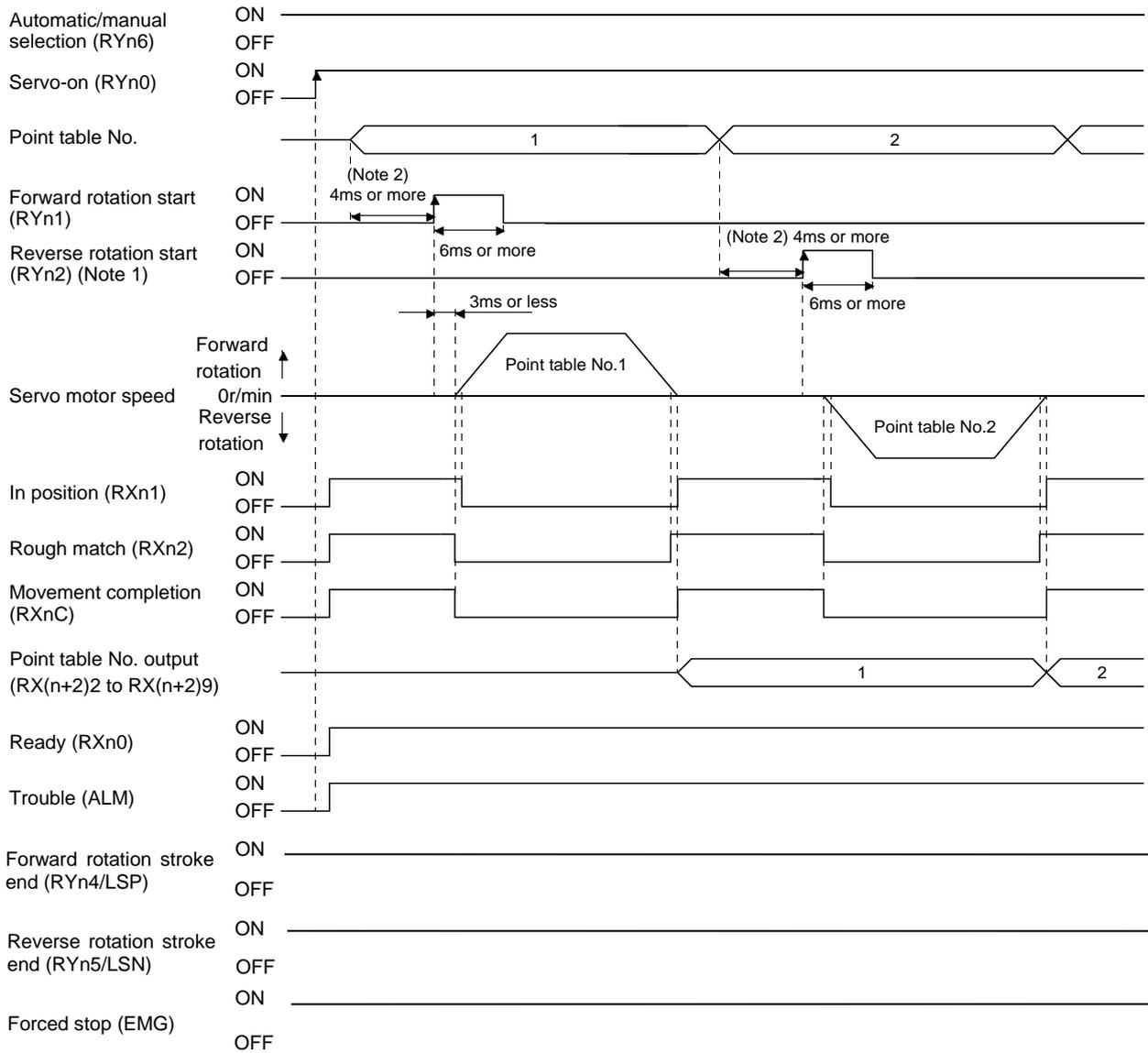
\*2: Can be automatic turned ON internally by setting parameters No.PD01 PD04.

(5) Selection of Forward rotation start (ST1) / Reverse rotation start (ST2)

Signal name (Device name)	Description	Device No.		Remarks
		1 station occupied	2 stations occupied	
Forward rotation start (ST1)	<p>1. In absolute value command system</p> <p>Turning RYn1 ON for automatic operation executes positioning once on the basis of the position data set to the point table.</p> <p>Turning RYn1 ON for a home position return immediately starts a home position return.</p> <p>Keeping RYn1 ON for JOG operation performs rotation in the forward rotation direction.</p> <p>Forward rotation indicates the address increasing direction.</p> <p>2. In incremental value command system</p> <p>Turning RYn1 ON for automatic operation executes positioning once in the forward rotation direction on the basis of the position data set to the point table.</p> <p>Turning RYn1 ON for a home position return immediately starts a home position return.</p> <p>Keeping RYn1 ON for JOG operation performs rotation in the forward rotation direction.</p> <p>Forward rotation indicates the address increasing direction.</p>	RYn1	RYn1	* 1
Reverse rotation start (ST2)	<p>Use this device in the incremental value command system.</p> <p>Turning RYn2 ON for automatic operation executes positioning once in the reverse rotation direction on the basis of the position data set to the point table.</p> <p>Keeping RYn2 ON for JOG operation performs rotation in the reverse rotation direction.</p> <p>Reverse rotation indicates the address decreasing direction.</p> <p>Reverse rotation start (RYn2) is also used as the start signal of the high-speed automatic positioning function to the home position.</p>	RYn2	RYn2	* 1

\*1: Can be used as external input signals of CN6 connector by setting parameters No.PD06 to PD08 and parameter No.PD12 to PD14.

(6) Timing chart of positioning operation (Point table method)  
 (Ex. Absolute value command system (PA01:0001))



Note 1. Reverse rotation start (RYn2/ST2) is invalid in the absolute value command system.

2. Configure a sequence that changes the point table selection earlier, considering the delay time of CC-Link communication.

Refer to "LECS Operation Manual", section 3.8, section 5.4 for details of the positioning operation program for the point table method.

## 8.2 Remote register method

Remote register method of positioning uses the remote register.

Set the position and the speed data by the remote register.

The constant for acceleration and deceleration is the set value of the point table No.1.

\* This operation is available when two stations are occupied.

Refer to "LESC Operation Manual", section 3.6.3, section 3.8.4, section 5.4.3 for details of the positioning operation program for the remote register method.

### 8.2.1 Positioning operation indication of the remote register method (Example)

(1) Positioning operation indication of the remote register method (Absolute value command system - Absolute value command) and Parameters, device

It sets the position command data and speed command data in the remote register(Absolute value command system – Absolute value command). Turning forward rotation start (RYn1) ON.

Positioning operation start to the Position data, speed data, acceleration time constant, deceleration time constant.

Please set the device and parameters.

#### Positioning operation (Absolute position command system - Absolute value command)

Item	Used device/parameter	Description
Command system	Parameter No.PA01	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 0 : Absolute value command system is selected.
Remote register-based position/speed specifying system selection	Parameter No.PC30	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> 2 : Remote register-based position/speed specifying system is selected. In the case, always set an acceleration/deceleration time constant in the point table No.1.
Automatic operation mode (MD0)	Automatic/manual selection (RYn6)	Turn RYn6 ON.
Remote register-based position/speed setting	Position/speed specifying system selection (RY(n+2)A)	Turn RY(n+2)A ON.
Absolute value/incremental value selection	Absolute value/incremental value selection (RY(n+2)B)	Turn RY(n+2)B OFF.
Position data	Position command data lower 16 bit (RWwn+4)	Set the lower 16 bits of position data to RWwn+4, and the upper 16 bits to RWwn+5. Setting range: -999999 to 999999
	Position command data upper 16 bit (RWwn+5)	
Servo motor speed	Speed command data (RWwn+6)	Set the servo motor speed.
Forward rotation start (ST1)	Forward rotation start (RYn1)	Turn RYn1 ON to start.

Set the position data to RWwn+4 / RWwn+5, and the speed command data to RWwn+6, and store them into the driver.

In the absolute value command system, Absolute value/incremental value selection (RY(n+2)B) can be used to select whether the values set to the position data are absolute values or incremental values.

The position data set to RWwn+4/RWwn+5 are handled as absolute values when RY(n+2)B is turned OFF.

The position data set to RWwn+4/RWwn+5 are handled as incremental values when RY(n+2)B is turned ON.

Turning forward rotation start (RYn1/ST1) ON.

Positioning operation start to the Position data, speed data, acceleration time constant, deceleration time constant.

(2) Selection of command system (PA01)

Select the command system.

Parameter No. PA01

0	0	0	
---	---	---	--

Selection of command system

0: Absolute value command system  
1: Incremental value command system

(3) Selection of remote register-based position/speed specifying system (PC30)

No.	Symbol	Name and function	Initial value	Unit	Setting range																
PC30	*DSS	<p>Remote register-based position/speed specifying system selection</p> <p>This parameter is made valid when Position/speed specification selection (RY(n.2)A) is turned ON with 2 stations occupied. Select how to receive the position command and speed command.</p> <p>When 1 station is occupied, selection of "0001" or "0002" will result in a parameter error.</p> <table border="1"> <tr> <td>0</td> <td>0</td> <td>0</td> <td></td> </tr> </table> <table border="1"> <tr> <th>Set value</th> <th>Position command</th> <th>Speed command</th> </tr> <tr> <td>0</td> <td>Specify the point table No.</td> <td></td> </tr> <tr> <td>1</td> <td>Set the position data.</td> <td>Specify the point table No.</td> </tr> <tr> <td>2</td> <td></td> <td>Set the servomotor speed. (Note)</td> </tr> </table> <p>Note. In the case, always set an acceleration/deceleration time constant in the point table No.1.</p>	0	0	0		Set value	Position command	Speed command	0	Specify the point table No.		1	Set the position data.	Specify the point table No.	2		Set the servomotor speed. (Note)	0000h		Refer to name and function column.
0	0	0																			
Set value	Position command	Speed command																			
0	Specify the point table No.																				
1	Set the position data.	Specify the point table No.																			
2		Set the servomotor speed. (Note)																			

(4) Selection of automatic/manual (MD0)

Signal name (Device name)	Description	Device No.		Remarks
		1 station occupied	2 stations occupied	
Automatic/manual selection (MD0)	Turning RYn6 ON selects the automatic operation mode, and turning it OFF selects the manual operation mode.	RYn6	RYn6	*1

\*1: Can be used as external input signals of CN6 connector by setting parameters No.PD06 to PD08 and parameter No.PD12 to PD14.

(5) Selection of position/speed specifying system (RY(n+2)A)

Signal name (Device name)	Description	Device No.		Remarks
		1 station occupied	2 stations occupied	
Position/speed specifying system selection	<p>Select how to give a position command/speed command. (Refer to section 3.6.3.)</p> <p>OFF: Remote input-based position/speed specifying system Specifying the point table No. with Point table No. selection (RYnA to RYnE) gives a position command/speed command.</p> <p>ON : Remote register-based position/speed specifying system Setting the instruction code to the remote register (RWwn+4 to RWwn+6) gives a position command/speed command. Set the parameter No.PC30 (direct specification selection) to "□□□2".</p>		RY(n+2)A	

(6) Selection of absolute value / incremental value (RY(n+2)B)

Signal name (Device name)	Description	Device No.		Remarks
		1 station occupied	2 stations occupied	
Absolute value/incremental value selection	RY(n+2)B is made valid when the remote register-based position/speed specifying system is selected with Position/speed specifying system selection (RY(n+2)A) and the absolute value command system is selected in parameter No.PD10. Turn RY(n+2)B OFF or ON to select whether the set position data is in the absolute value command system or incremental value command system. OFF: Position data is handled as an absolute value. ON : Position data is handled as an incremental value. (Refer to section 3.6.3.)		RY(n+2)B	

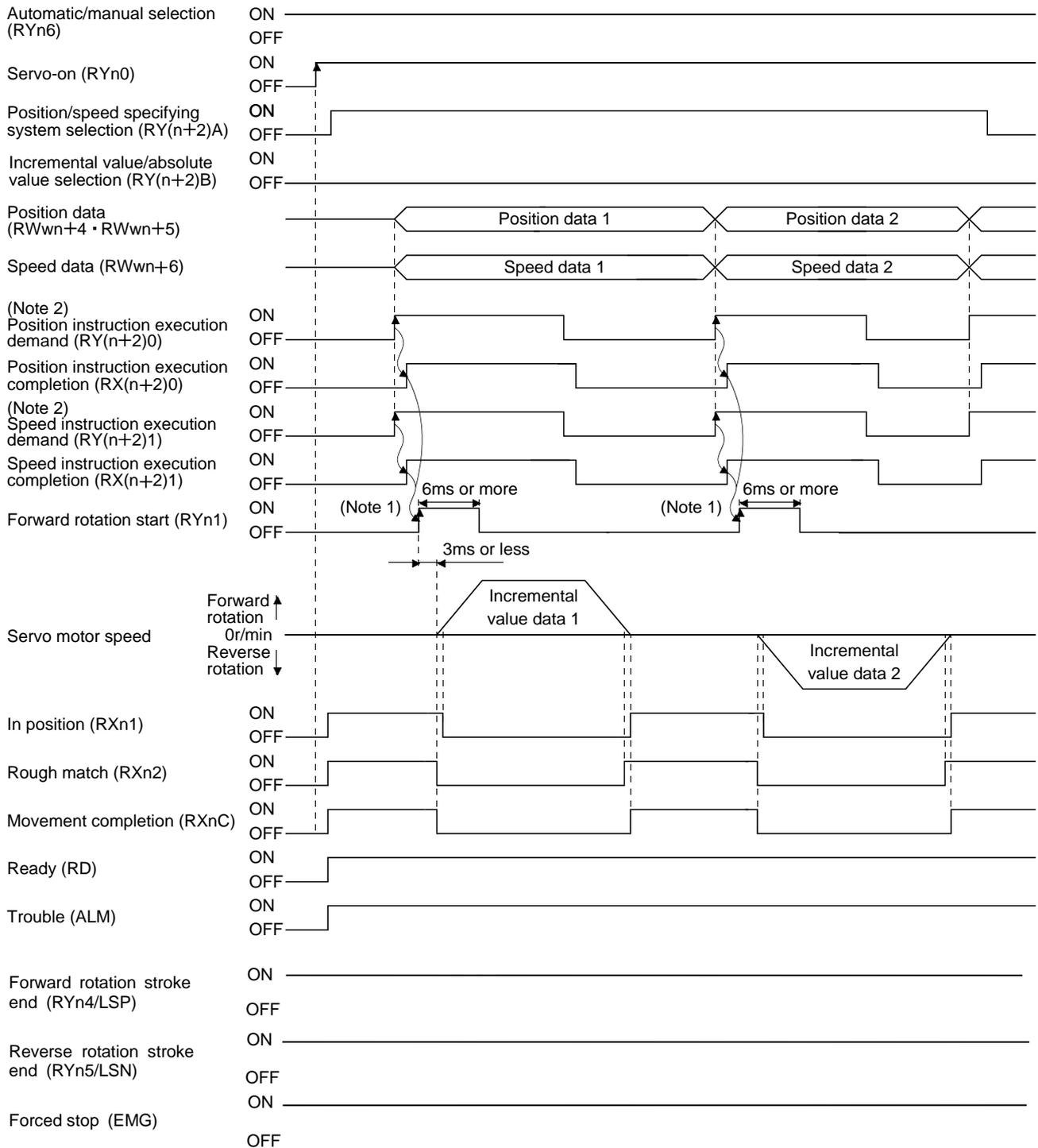
(7) Selection of position command data (RWwn+4 + RWwn+5) and speed command data (RWwn+6)

Remote register		Signal name	Description	Setting range
1 station occupied	2 stations occupied			
	RWwn+4	Point table No./Position command data lower 16 bit	Set the point table No. to be executed in the automatic operation mode when 2 stations are occupied. When the point table No. is set to RWwn+4 and RY(n+2)0 is turned ON, the point table No. is set to the driver. On completion of setting, RX(n+2)0 turns ON. When the point table is not used, set the position command data.	Point table No.: 0 to 255  Absolute value command: Position command data: -999999 to 999999
	RWwn+5	Position command data upper 16 bit	When the lower 16 bits are set to RWwn+4 and the upper 16 bits to RWwn+5, and RY(n+2)0 is turned ON, the position command data in the upper and lower 16 bits are written. On complete of write, RX(n+2)0 turns ON. Use parameter No.PC30 to select whether point table No. setting or position command data setting will be made. Refer to section 3.6.3 for details of Point table No./Position command data.	Incremental value command: Position command data: 0 to 999999
	RWwn+6	Point table No./Speed command data	When the point table is not used, set the point table No. to be executed or the speed command data (servo motor speed [r/min]). When the point table No. is set to RWwn+6 and RY(n+2)1 is turned ON, the point table No. or speed command data is set to the driver. On completion of setting, RX(n+2)1 turns ON. Use parameter No.PC30 to select whether point table No. setting or speed command data setting will be made. Refer to section 3.6.3 for details of Point table No./Speed command data.  When setting the servo motor speed in this remote register, always set the acceleration/deceleration time constant in the point table No.1.	Point table No.: 0 to 255  Speed command data: 0 to permissible speed



(9) Timing chart of positioning operation (Remote register method)

(Ex. Absolute value command system (PA01:0001) - Absolute value (RY(n+2)B: OFF))



Note 1. Configure a sequence that changes the point table selection earlier, considering the delay time of CC-Link communication.

2. For details of the operation timing of RY(n+2)0 and RY(n+2)1, refer to the section "LESC Operation Manual", section 3.6.2.

Refer to "LESC Operation Manual", section 3.6, section 3.7, section 5.4 for details of the positioning operation program for the remote register method.

## 9. Troubleshooting

### 9.1 Alarms and Warning List

#### POINT

- Configure up a circuit which will detect the trouble (ALM) signal and turn off the servo-on (RYn0) at occurrence of an alarm.

When a fault occurs during operation, the corresponding alarm or warning is displayed. If any alarm or warning has occurred, refer to "LECSC Operation Manual", section 10.4.2 or 10.4.3 and take the appropriate action. When an alarm occurs, ALM turns off.

After its cause has been removed, the alarm can be deactivated in any of the methods marked ○ in the alarm deactivation column.

	Display	Name	Alarm deactivation			Display	Name	
			Power OFF→ON	(Note3) MR Configurator 2™ parameter unit	(Note2) Alarm reset (RES)			
Alarms	A10	Undervoltage	○	○	○	Warnings	A90	Home positioning incomplete warning
	A12	Memory error 1 (RAM)	○				A92	Open battery cable warning
	A13	Clock error	○				A96	Home position setting error
	A15	Memory error 2 (EEP-ROM)	○				A98	Software limit warning
	A16	Encoder error 1 (At power on)	○				A99	Stroke limit warning
	A17	Board error	○				A9D	CC-Link warning 1
	A19	Memory error 3 (Flash-ROM)	○				A9E	CC-Link warning 2
	A1A	Motor combination error	○				A9F	Battery warning
	A20	Encoder error 2 (during runtime)	○				AE0	Excessive regeneration warning
	A21	Encoder error 3 (during runtime)	○				AE1	Overload warning 1
	A24	Main circuit error	○	○	○		AE3	Absolute position counter warning
	A25	Absolute position erase	○				AE6	Servo emergency stop warning
	A30	Regenerative error	(Note 1) ○	(Note 1) ○	(Note 1) ○		AE8	Cooling fan speed reduction warning
	A31	Overspeed	○	○	○		AE9	Main circuit off warning
	A32	Overcurrent	○				AEC	Overload warning 2
	A33	Overvoltage	○	○	○		AED	Output watt excess warning
	A35	Command pulse frequency alarm	○	○	○			
	A37	Parameter error	○					
	A45	Main circuit device overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	A46	Servo motor overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	A47	Cooling fan alarm	○					
	A50	Overload 1	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	A51	Overload 2	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	A52	Error excessive	○	○	○			
	A61	Operation alarm	○	○	○			
	A8A	Serial communication time-out	○	○	○			
	A8D	CC-Link alarm	○	○	○			
	A8E	Serial communication error	○	○	○			
888	Watchdog	○						

Note 1. Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.

2. Turns on RY(n+1)A or RY(n+3)A.

3. Clicking the "Alarm reset" button on the "Alarm display" screen of set up software (MR Configurator2™) allows an alarm to be deactivated. Pressing the "STOP RESET" key of the parameter unit allows an alarm to be deactivated.

## 9.2 Alarm Display

The contents of the alarm / warning that is currently occurring in the driver are displayed in the alarm display function of the setup software.

In addition, history is listed for alarms that occurred in the past.

- ① Click “Diagnosis” - “Alarm Display” of the setup software to display “Alarm Display” window.
- ② Alarms / warnings currently occurring in the driver display the contents.  
If no alarm / warning has occurred, it will not be displayed.
- ③ Lists the history (Maximum 6 cases) of alarms that occurred in the past.  
(Warnings are not displayed.)



**Alarm Display**

Axis 1

No.	Name	Est. occurrence time	Est. elapsed time (h)	Detailed information
AL.16	Encoder error 1 (At power on)	2017/04/04 15:31:58	0	44

Encoder connector (CN2) disconnected.  
Encoder fault.  
Encoder cable is faulty.  
(Wire breakage or shorted.)  
Encoder cable type (2-wire, 4-wire) selection was wrong in parameter setting.  
External noise caused the communication error.  
-<Checking method>  
• Check that the encoder cable and the power cables are wired side by side.  
• Check that the servo amplifier is not influenced by noise of magnetic valves, magnetic contactors or relays.  
• Check the grounding of the servo amplifier and the servo motor.  
• Check that there is no cause of static electricity around.  
• Check that the shield of the encoder cable is made correctly.  
Additional information:(Alarm reset disable)

Alarm history

	Number	Name	Time (h)	Detailed information
New	AL.20	Encoder error 2 (during runtime)	26	47
1	AL.16	Encoder error 1 (At power on)	26	44
2	AL.20	Encoder error 2 (during runtime)	26	47
3	AL.16	Encoder error 1 (At power on)	26	44
4	AL.52	Error excessive	26	04
5	AL.52	Error excessive	26	04

#### Revision history

No.LEC-OM06001  
Dec./2012 1st printing  
No.LEC-OM06002  
Dec./2013 2nd printing  
No.LEC-OM06003  
Jul./2014 3rd printing  
No.LEC-OM06004  
Apr./2015 4th printing  
No.LEC-OM06005  
Sep./2015 5th printing  
No.LEC-OM06006  
Dec./2015 6th printing  
No.LEC-OM06007(No.JXC※OMT0056)  
Sep./2016 10th printing  
No.LEC-OM06008(No.JXC※OMT0056-A)  
Jun./2017 11th printing

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.  
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